NEWS 176

June 2023

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Contents NEWS 176 **June 2023**

Cover illustration: "Central Mike Says" The Central Tool Co., RI, USA c.1947

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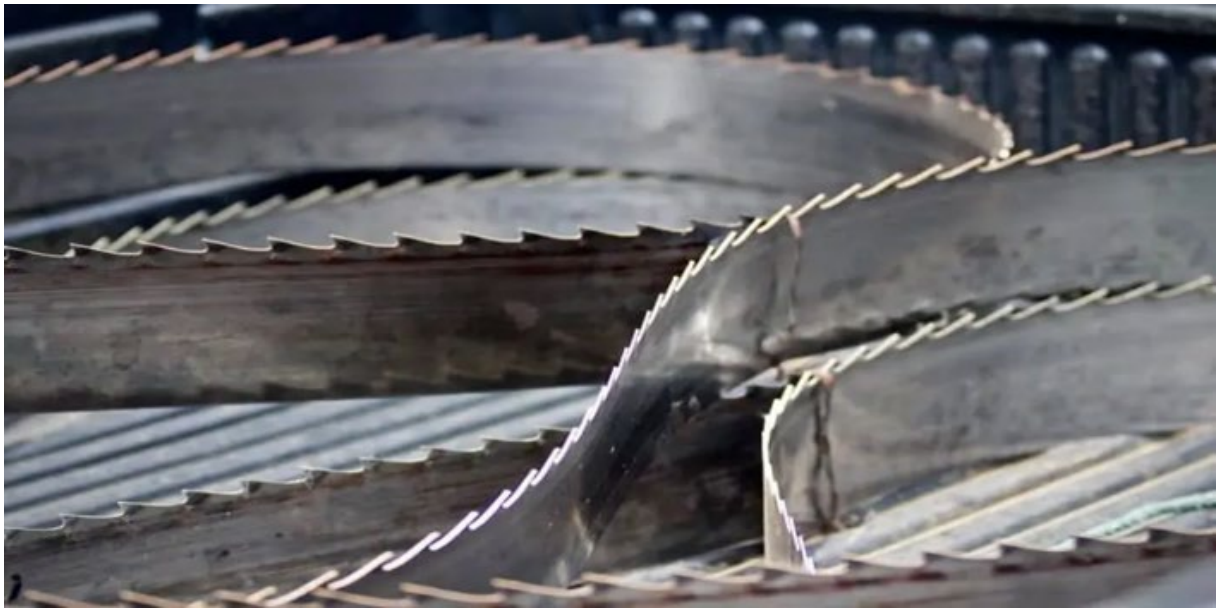
Bandsaw Tensioning

by Michael Williams

I recently started encountering tyre slip on my Chinese made 14-inch bandsaw and was considering removing the lower tyre and gluing it back with contact adhesive. (It had worked quite well when I did the top wheel some months back). Bob Crosbie suggested that I scrap the rubber tyres altogether and consider urethane tyres which are now available for DIY fitting, and I did just that.

Resetting up the machine again with the new tyres, I had of course needed to set the blade tension and in my mind, the usual questions raised themselves again i.e. How much tension should I use? How do I estimate the actual tension? and, that great arguing point, should I de-tension the blade after use?



The answer to the first question (if you take any notice of the bandsaw manufacturers) is pretty clear cut. They suggest a sawblade tension of 10,000 to 15,000 psi (pounds per square inch) and not greater than 35,000psi. Hooley-Dooley I thought, the ultimate tensile strength of blade steel is only about 60,000psi and they are suggesting that you can tension up to more than half that! This is only a safety margin of less than 2 and we are talking of a pseudo-domestic appliance here.

This got me thinking as to what sort of tension I had been running the bandsaw in the past. I don't have a fancy tension gauge and have always thought that gauging the tension by pushing the blade with one's thumb and measuring the deflection, posed more questions than it answered so I resorted to a few crude calculations to at least put my mind into the ballpark.

Let's start with my default blade, a ½ inch 4tpi workhorse. It measures actually only 3/8 inch wide if you ignore the teeth which don't play a significant role in the blade tension. The blade is about 30 thou thick so the cross-section area is 0.375x0.030 or 0.01125 square inches. To give us 15,000 psi, this will require a force of 15,000 x

0.01125 or 168 lbs. This will be provided by the tensioning adjuster which moves the two bandsaw wheels apart and it will have to provide twice this figure (336 lbs) as the tension in the blade is pulling down on both sides of the top wheel.

The adjuster provides this load by turning a 3/8 Whitworth screw against the bandsaw frame, forcing the top wheel upwards away from the lower wheel. The situation is a bit more complex than this as turning the adjuster also compresses a spring which provides a sort of shock absorber to the blade tension. Initially if we ignore the effect of the spring, we can calculate just the torque required by the screw adjuster.

There is a rule of thumb that allows us to calculate the torque that that a tensioning screw requires to generate a known force and it is a good enough approximation in the current scenario.

$$W = 13 \times T$$

where W is the known required force (336 lb), and T is the torque in pound inches. Re-arranging, T = W/13 or 26 lb-inches. Now I have a 2½ inch crank handle on the adjuster so I should apply a force on the crank handle of 26/2.5 or roughly 10 lbs to generate a blade tension of 15,000 psi.

Well, I set up the machine with what I thought was sufficient tension to track flawlessly and then measured the torque that I had had to use by pulling on the adjuster crank with a spring balance. Imagine my surprise when I discovered that the spring balance only registered 4lb force! This meant that even if the adjusting spring wasn't compressed at all and could be ignored in the calculation, the tension in the sawblade was probably only 6,000 psi and it tracked flawlessly!

What is the conclusion to all this? It means that your simple small 14-inch bandsaw doesn't require the sort of tension levels suggested to operate properly and moreover, this tension is way below the ultimate tensile stress levels of the blade, meaning the possibility of a blade breaking catastrophically is just about zero.

Better than all of the above, it means that de-tensioning the blade after use is an unnecessary task as the blade and tyre stress levels are already way below the levels that would be encountered if the blade manufacturer's recommended levels were used. It also obviates the possible disaster that can happen if you have de-tensioned the blade and forgotten to re-tension it prior to use.

Comments from the Editor:

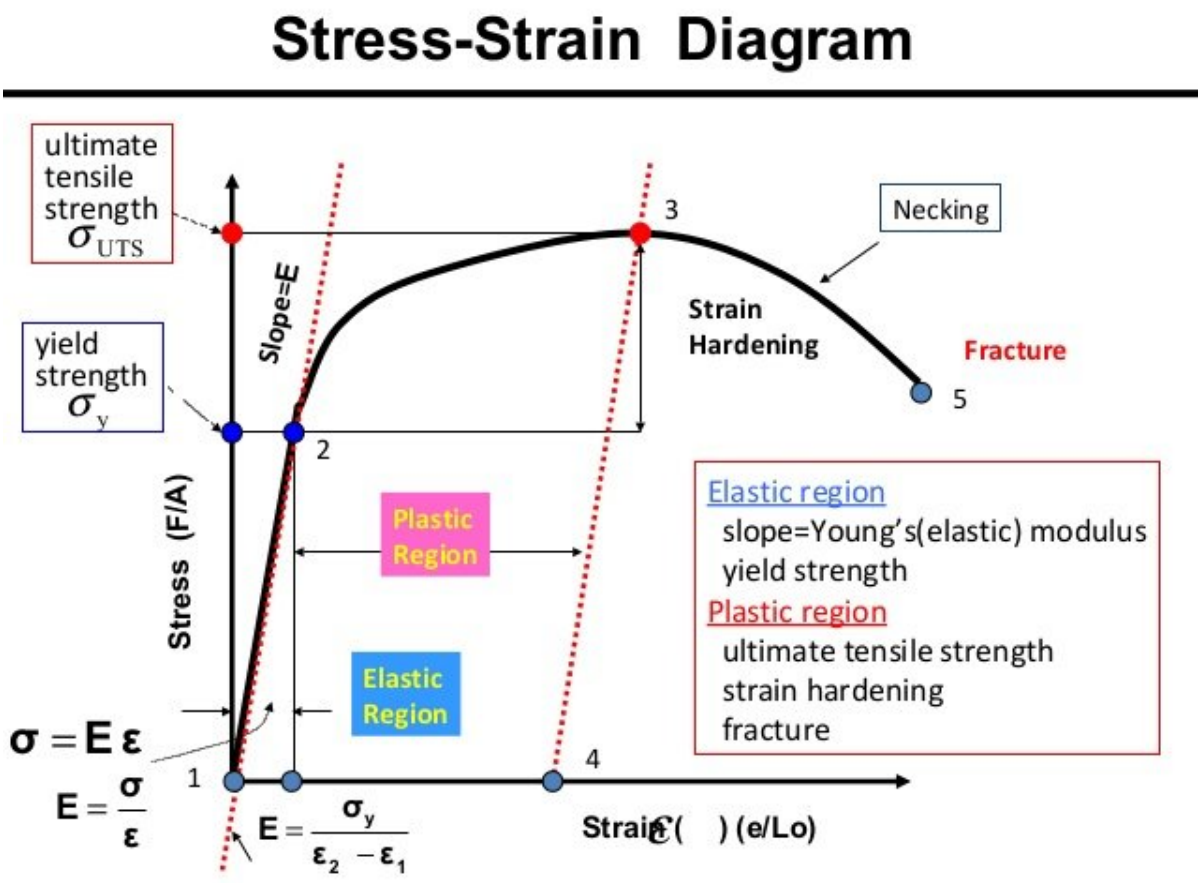
A most interesting article from Michael Williams. After reading it I had a few thoughts of my own on the bandsaw tensioning issue. So here goes.

First is the issue of the actual stress experienced by the blade. Now I'm not a woodworker, but I know that the bandsaw blade experiences various stresses and strains as it does its job, and even while at rest.

When in motion the blade, in theory, goes from an evenly applied cross-sectional stress during straight running to differential stress as it proceeds around the bandsaw wheels. In theory only the central fibre of the blade is uniformly stressed. During tracking around the wheel the blade bends. Consequently the inside face of the blade is under compression while the outer face of the blade comes under tension due to this bending. The blade guides introduce further, indeterminant, stresses. So in addition to the applied blade tension of say 15,000 pounds or so the blade is also acted upon by these cyclical forces as it makes its way around the wheels. But are these forces critical to the bandsaw tensioning issue?

My second concern is the issue of how much blade pre-tension to apply and once applied should it be released when the machine is not in use. My approach would be to not tension the blade beyond the elastic limit of the material from which it is made. The elastic limit is the minimum stress under which the object carries a permanent deformation, while the tensile strength is the maximum stress that an object can withstand before breaking or collapsing.

So what is the elastic limit of a bandsaw blade? How much blade tension is required to exceed that limit? I have no idea.



Send your comments to the Editor at reproturn@bigpond.com

Articles from the Archives

by NEWS Editor

Wood Infill Planes

Bob Crosbie

Fact and fantasy

Recently I was looking at the web site of a prominent New York tool dealer. Frankly I look at the picture and usually skip the words. This time I read the description of one of the planes. Something along the lines of, "face made of Blister Steel". How did he identify the type of steel?

I kept reading and learnt that in the early nineteenth century anyone could buy steel plates and fabricate a wood infill plane. Also I was intrigued by the proposition that wood filled mitre planes were used to finish marquetry.

These assumptions can be easily refuted as indeed some have been by writers willing to spend large amounts of time online. I intend to try and put the discussion of wood infill planes back on the tracks by looking at some evidence. There are two key questions!

What types of wood infill planes were made in the British Isles in the Nineteenth Century?

What materials were used to make wood infill planes in the British Isles in the Nineteenth Century?

To answer these questions I intend to use evidence from primary sources. Wild speculation is left to others.

The evidence for the types of wood infill planes comes from textbooks and tool catalogues. In the texts there are few references to metal planes. Even the cheaper USA cast iron planes are rarely mentioned.

Tool catalogues are a better source of information. For the first half of the nineteenth century the lists of wood infill planes are uncommon.

The Early American Industries Association's 1975 reprint of *Joseph Smith Explanation or Key to the Various Manufactories of Sheffield* edited by John S Kebabian includes a reprint of *James Cam, and Marshes and Shepherd List*, dating this list is problematic, maybe 1830s.

The only wood infill plane listed is;

694 Brass Mitre Plane with steel face

Was this the only type of wood infill plane made in the first half of the nineteenth century?

The Holtzapffel & Co. 1834 Catalogue lists the following wood infill planes;

377 Mitre Planes
of iron, with steel faces

377A Rebate

520 Iron Planes for Metal

520A Iron, Mitre, and Rebate Planes,
For Joiners, & c.

377, 377A and 520A are clearly wood lined 'iron' planes. I suspect 377A was made from the same materials as 377, 'of iron, with steel faces'.

The precision description 'of iron, with steel faces' reveals that these planes were fabricated from rolled plates. The joining method must be dovetailing.

This list raises another question;

What about Cast Iron infill planes?

I suggest the vast majority of cast iron planes are post 1850, the period when improved foundry practices allowed such planes to be produced cheaply. The best cast planes were malleable castings, a technology developed in the second half of the nineteenth century. For the moment I intend to only consider fabricated planes.

The fabricated infill planes made in the nineteenth century

From the *Marshes and Shepherd List* and from the *Holtzapffel & Co. 1834 Catalogue* the following infill planes were commercially produced in the first half of the nineteenth century.

-Brass sides with steel sole.

-Iron sides with steel sole.

The brass sides may have been made from rolled brass plate. So far, I have found very little information on brass plate production in the first half of the nineteenth century.

What type of iron and steel?

The iron sides were made from *rolled wrought iron plate.*

Establishing the type of steel used involved some research into the cutlery trade and into iron and steel production. The first half of the nineteenth century was a period of accelerated development of improved methods of iron and steel production. This new technology facilitated the commercial making of infill planes.

In the *Circle of the Mechanical Arts* published in 1813 Thomas Martin provides a cameo view of tool making.

THE manufacture of edged tools is one of the first arts among men in every state of society. Workmen in general are aware of the necessity that the instruments of their respective trades should be made to possess the qualities adapted to the operations by which they gain their subsistence: and, among the various subdivisions of labour, there is no material upon which the skill of mechanics is more exercised than steel.

The makers of files, of chisels, of planes, and saws, and the infinite variety of knives, all occupy departments separate from each other, and possess their respective degrees of celebrity, which are grounded on their knowledge of the peculiar kinds of steel, as well as the methods of working them, which are best adapted to the intended operations. Many of these methods are kept secret; but there are some manufacturers who have no reserve with regard to the manipulations of their art and have the spirit to assert their claims to public encouragement upon the fairground of the address and integrity with which they conduct their labours.

Martin describes a complex industry based on specialisation and motivated by quality driven competition.

Before determining what type of steel was used for fabricated plane soles I need to return to the topic of wrought iron. The development of rolled plate iron transformed the British Isles.

Wrought Iron

Before Bessemer developed mild steel in 1855 all iron plate was charcoal smelted puddled and rolled wrought iron. *The Real Wrought Iron Company* web site describes this type of iron;

'Charcoal iron sheet is soft and malleable when annealed, so that a good depth of cold working and sharp detail is possible without cracking. It is softer and more pleasant to work than mild steel. ..... '

In London in the 1820s and 1830s wrought iron sheets were being used by the 'pioneer' engineers such as Henry Maudslay and his circle. These early engineers frequented the retail tool shop Holtzapffel & Co and some of them worked in the Holtzapffel & Co factory on ingenious machines.

Large tool dealers like Holtzapffel & Co were in a position to exploit the new materials by jobbing out work such as dovetailing plane bodies to numerous engineering works.

To the 'man in the trade' this was commonplace knowledge but to wood workers this was a foreign land. The probability of a wood trade based tradesman buying off cuts of wrought iron plate and steel and with a few files making an infill plane is remote.

Later in the nineteenth century cast iron plane bodies were sold retail and such tradesman did make infill planes from casings. Even then most casting were sold "ready machined", machine planed sides and sole.

What of Bessemer's mild steel?

Mild steel is harder to work than wrought iron. However it does not have a laminar structure meaning it corrodes easily. By the turn of the nineteenth century mild steel plate was cheaper than wrought iron plate. I suspect it was then used for plane sides and soles. This would explain the ambiguous wording in catalogues such as Mathieson's *'steel wrought dovetailed planes'*. Wrought meaning worked rather than wrought iron.

Steel Soles

By the turn of the nineteenth century virtually all the steel used for quality tools was *cast steel.*

The Tilt Hammer website describes cast steel production in Sheffield

Until 1742, producing steel was a difficult task. The quality of the steel was often unreliable. The steel was made by heating iron bars which were covered in charcoal. The heating was continued for up to a week.
The material produced was called ***blister steel****.*
Blister steel was then turned into ***shear steel*** *by wrapping blister steel bars up in a bundle and then heating them again before forging the bundle. The heat and the action of the forge hammer welded the rods together as they were hammered to the size required. This shear steel was used to make razors, files, knives, swords and the other steel items for which Sheffield became famous.*
Benjamin Huntsman's crucible steel process changed all that. He was the first person to cast steel ingots. The process produced uniform high quality steel in reasonably large quantities.

The steel used for plane soles

Certainly not blister steel. Consulting the 1813 publication *Cyclopædia; or, universal dictionary of arts, sciences, and ..., Volume 34'*

Superior quality of cast steel

This is what renders cast-steel so much better for polished goods: for when blistered steel is attempted to be polished, the surface is seen to abound with numerous spots, arising from mechanical defects in the bars previous to conversion.

Shear steel was better than blister steel and had been previously used for file production. However by the first half of the nineteenth century shear steel was only used for large files.
I have not located any steel lists from the first half of the nineteenth century, so my conclusions are tentative. If double shear steel (refined shear steel) was available in wide rolled plates, it may have been used for plane soles. As cast steel plate was used for files, I suspect wide cast steel plates were available and would have been the preferred material for plane soles.

The other plane components

Plane blades were made from wrought iron plate with a cast steel face fire welded to the cutting end of the blade. Cap irons were wrought iron and later mild steel. Plane iron screws, side screws and rivets were wrought iron. Every improvement in steel technology is reflected in the production of plane blades. When electric furnaces were introduced late in the nineteenth century one edge tool maker sold *'electro boracic steel'.*

The timbers used to infill commercial planes were standardised by the mid nineteenth century. In the South the most common infill wood was Brazil rosewood. Early in the century this was often 'faced up' on beech but later it was used in the solid. The Northern makers favoured rosewood, but many Scots planes were lined with walnut.

The first infill planes made

The Gabriel Inventories from 1801 include components for iron mitre planes. Mitre planes were certainly being made late in the eighteenth century. What were they used for? Forget the theory about surfacing marquetry; these planes were used for precision planing of exotic timbers. The diverse trades using mitre planes included trades such as mathematical instrument making, harp and piano forte making and cabinet making.

The Holtzapffel & Co. 1834 Catalogue suggests wood lined metal rebate and bench planes also have a long lineage.

Cast Iron planes

There are articles in nineteenth century magazines on how to make cast iron planes. These explain how to make the pattern, arrange casting and how to dress and line the plane. There are warnings against 'white iron' casting and emphasis on soft 'scotch iron' castings. Cast planes, often lined with Walnut, are common in Scotland.

I cannot find any nineteenth century magazine articles on 'how to make a dovetailed plane.'

The article above was written by Bob Crosbie and published in TTTG NEWS 118 (April 2011, pp.22-25).

More Articles from the Archives in the next issue of TTTG NEWS magazine.

Got an interesting advertisement or article form the past that you would like to see published in NEWS?

Send it to

NEWS Editor editor@tttg.org.au

as a Word, pdf or jpeg file
or send an original via post to:

TTTG NEWS Editor
5 Morvan Street
Denistone West NSW 2114.

Handles for Stanley Planes

Exclusive to TTTG

Handles to fit Stanley planes, and copies of Stanley planes, are sold at all TTTG meetings, tool sales, events and workshops. Price is $10 per handle.

What Planes?
TTTG handles are close copies of old broken handles from old planes. The TTTG handles are not based on “Type drawings” from the internet.

What sizes?
TTTG handles are available to fit No.2 to No.7 Stanley and Bedrock planes. The handles will also fit Record, Sargent, Pope/Falcon, Carter and similar.

What timber?
TTTG handles are for planes made in the years 1900 to 1960s. The handles are made from recycled or off cut well-seasoned hardwoods. Species include NSW Rosewood, American Beech, Kwila, and Camphor Laurel.

How are the handles made?
TTTG handles are produced with a sequence of machining jigs in batches. After profile shaping the handles are drilled for the metal fittings. Batch production means consistent quality and reasonable price.

The timber is prepared in minimum lengths of 600mm, 140mm x 24mm. After machining and drilling the handles are “ready to sand and fit.

Want a handle made from your own piece of timber? Then you will have to make it!

Some Handles have long toes!
The length of the toes on the No.3 and No.4 planes varies with the age of the plane. Some TTTG handles for these planes are sold with long toes. The buyer can then “custom fit” the handle. A simple job for a plane user.

Sanding
The machining leaves the handles needing only a light hand sanding. The golden rule is “don’t sand across the grain.”

Finish
The original finish on the old plane handles was “industry normal” for the time and includes Shellac, Varnish, Nitrocellulose, and Polyurethane. TTTG’s supplier recommends Liquid Shoe Polish. This matches any colour and lasts.

Some buyers may pick up a finished ‘sample’ handle and ask is it “Rosewood.” The answer is: “Camphor Laurel finished with Liquid Shoe Polish.”

The Bench

by John Daniel

Walking into my shed for the first time, you may be a little surprised that there is not a pristine bench to catch your eye, a show piece without a blemish, just a humble battered workpiece made close to sixty years back. Recycled 4”x4” hardwood salvaged from an old building was used for legs and rails and two freshly milled planks of 9”x2”x 5ft Stringy Bark for the top working surface.

The Bench

A recycled panel of kauri Pine panel from an old wardrobe was used for the well between the two surface planks.

A wooden bench-stop and a second-hand 7” JOPLIN vice (made in Australia) was fitted at one end of the bench and a patented cast metal stop on the other. Following tradition, a good soaking of linseed oil on the wood to complete the job. As the need arose, or focus changed, a RECORD 10” quick-release vice was fitted. Much later, I was given a vice screw, so, with a couple of Spotted Gum cricket stumps for guide rods a 15” length of Brush Box for a jaw, another vice was added in line with the RECORD vice (three vices on the one bench?).

The metal bench-stop

The wooden bench-stop

The wooden vice

Bick iron, hatchet stake and other sheet metal work tools

Storage underneath

I have often been asked, “why the holes in the bench”? good question, especially as so many woodworkers are protective of ‘their bench’, as for me, the bench is just another tool, my only requirement of it that it be flat, have at least a couple of vices, a bench-stop and that it is solid and stable. Then, why the holes?

When relief carving, biscuit-jointing, hollowing out chair-seats, or just using a router to remove a sharp arris on a cutting-board, securely holding the work to the standard bench surface is a must, and as I do not have any ‘holdfasts,’ what’s the harm in a few more holes in my battered and scarred old bench?

Over the years, the bench, a ‘work’ bench not just a woodwork bench, has morphed into a most versatile piece of shed furniture, a focal point as one walks into the shed, the bench is the hub of the shed, and must add, it is jolly handy to rest an elbow when spinning yarns with a few mates without having to worry about coffee/tea stains.

I have lost count of the number of wipe-overs of linseed oil the bench has had over the years, never feeling apologetic for the oil-highlighted scars and bruises, they just remind me of the work it has enabled me to do; it is a one off, I cannot for-see ever making another one.

JD

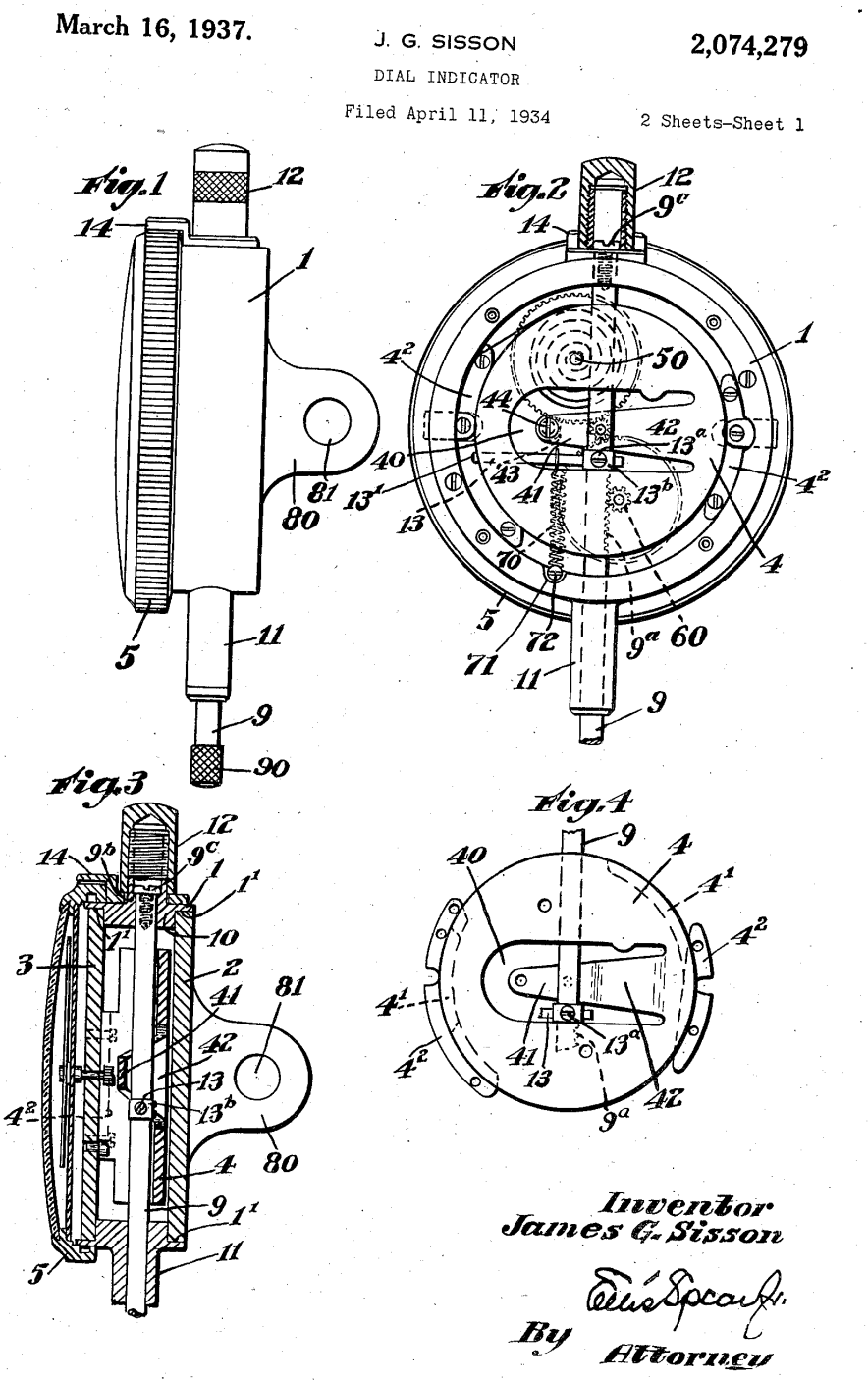
Got something special or interesting you would like to share?

Then please send me a picture and description and I will put it into NEWS.

Email your text and images to reproturn@bigpond.com

The Wonderful World of Patents

Patent drawings for some of the inventions by James G Sisson - assigned to L S Starrett Co., Athol, MASS, USA



SOURCE: US PATENT OFFICE

J. G. SISSON.

WORK CLAMP.

APPLICATION FILED DEC. 28, 1911.

1,039,831. Patented Oct. 1, 1912.

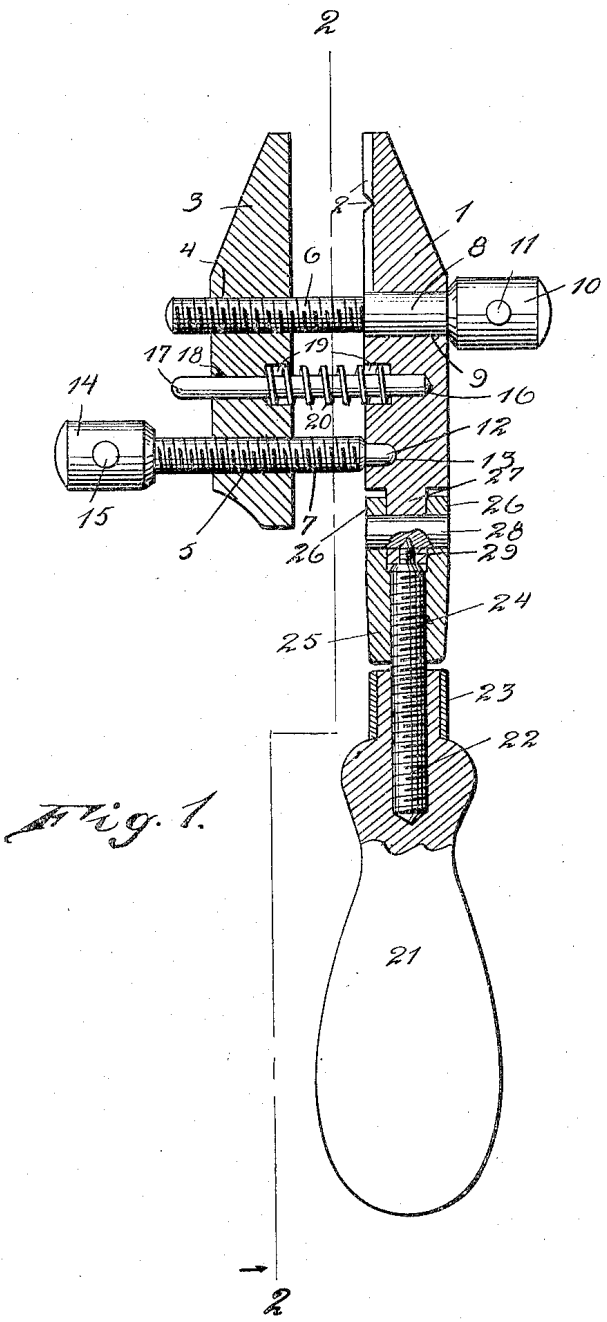


Fig. 1.

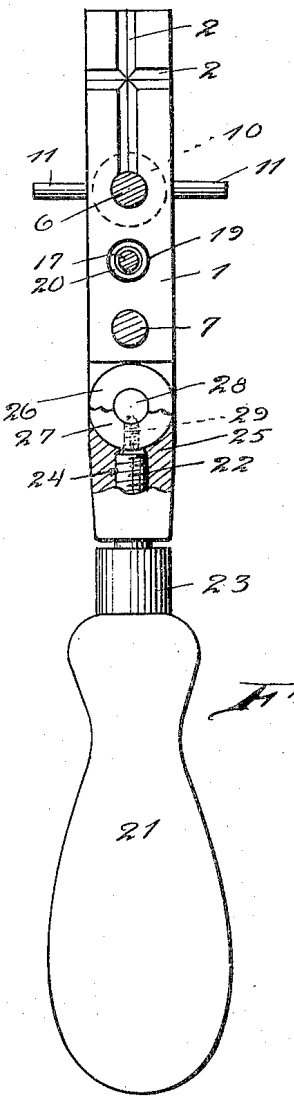


Fig. 2.

Inventor

J. G. Sisson

Witnesses

May 14, 1940. J. G. SISSON ET AL 2,200,479

DIAL THICKNESS GAUGE

Filed May 18, 1939

Fig. 1

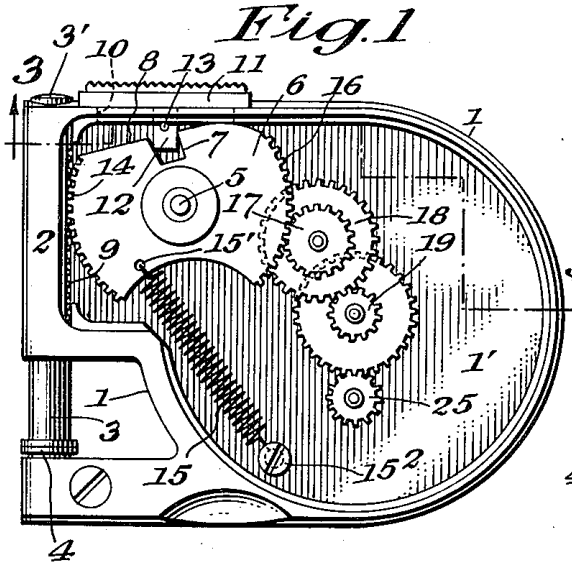


Fig. 2

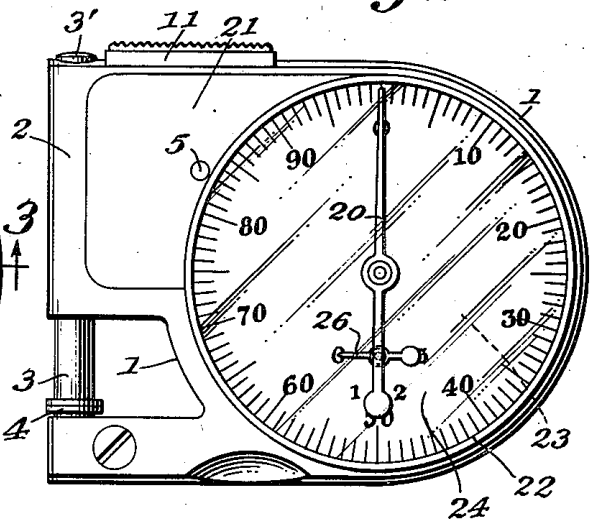


Fig. 3

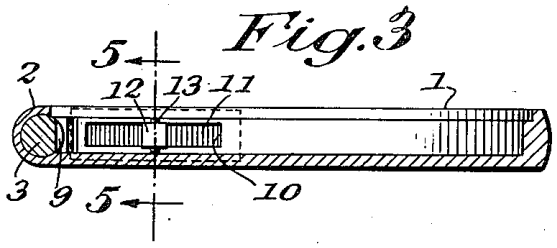


Fig. 4

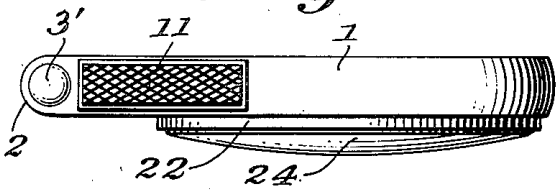


Fig. 5

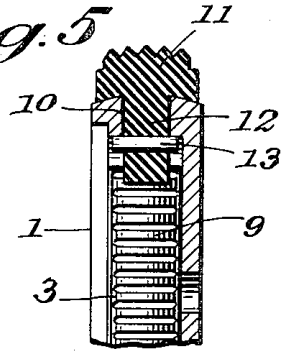
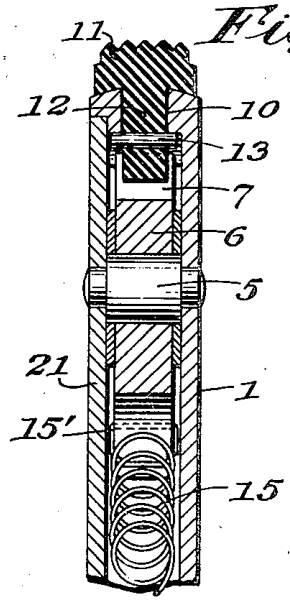


Fig. 6

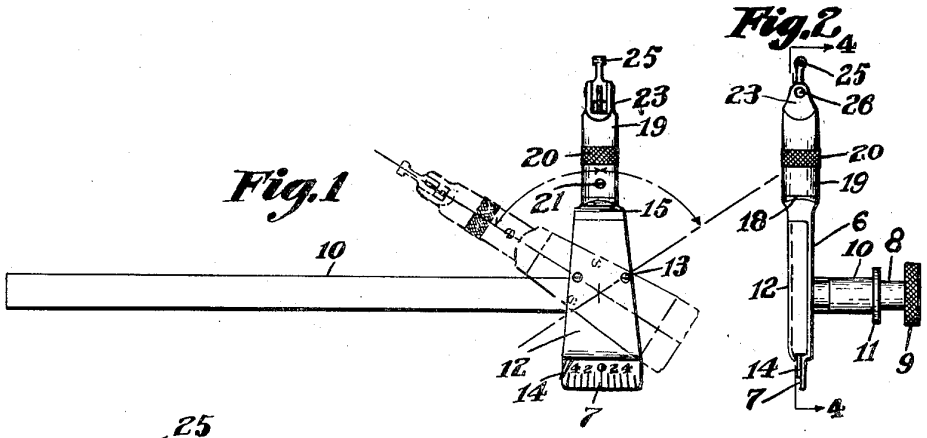


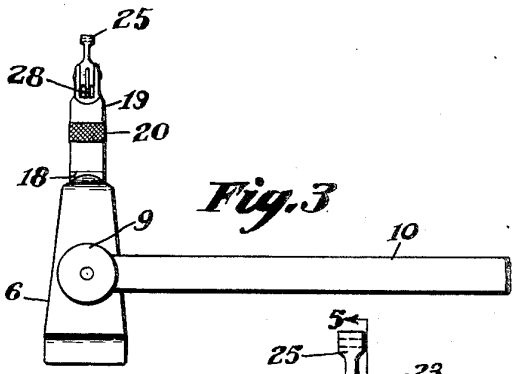
SOURCE: US PATENT OFFICE

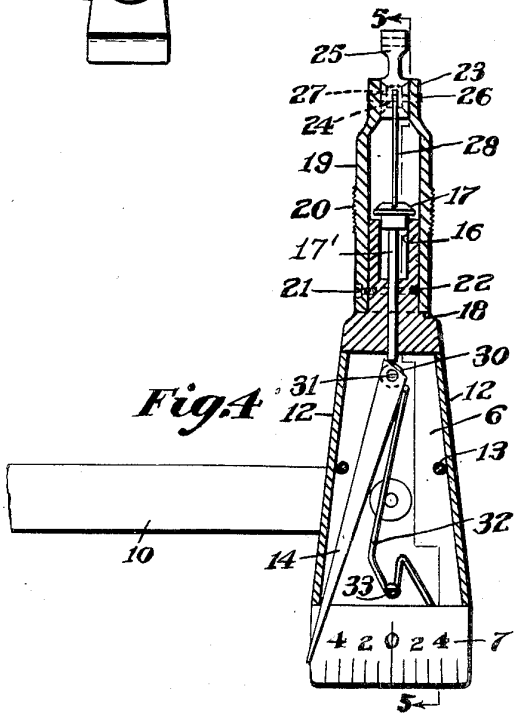
March 27, 1934. J. G. SISSON 1,953,028

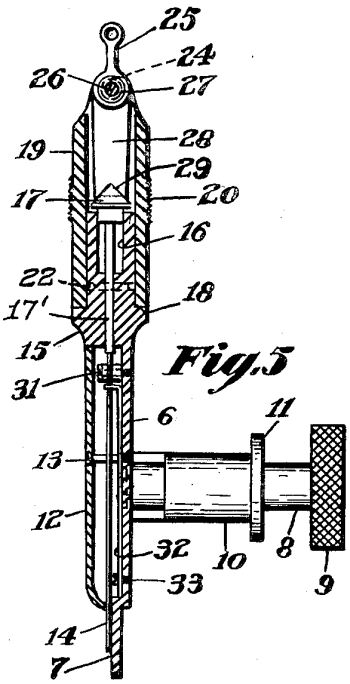
INDICATOR

Filed Oct. 10, 1932









Inventor
James G. Sisson

By Ellis Spear Jr
Attorney

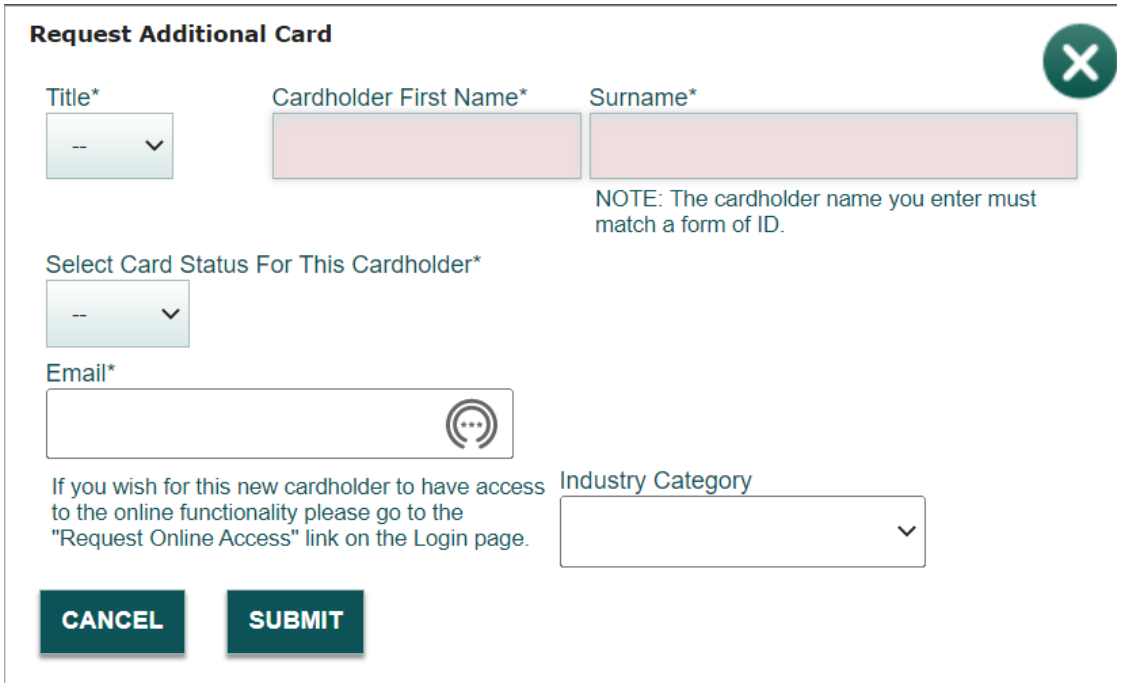
SOURCE: US PATENT OFFICE

TTTG Member Access To Bunnings PowerPass Trade Card

All TTTG Members can obtain a Bunnings PowerPass Card. To do this please contact the Secretary, John Bates, at secretary@tttg.org.au and provide the following information:

- Your title (Mr, Mrs, Ms etc);
- Your first name and surname (this must match your driver's licence or other form of ID which you use); and
- Your email address.

The TTTG Secretary will then use that information to Request an Additional Card from Bunnings in your name.



Benefits of a Bunnings PowerPass Card:

- Access to exclusive PowerPass Pricing and offers
- Invitation to Trade events
- Full online access to manage your account
- Use your PowerPass in all Bunnings stores Australia-wide
- More information at https://trade.bunnings.com.au/powerpass

A special thank you to TTTG Member, Greg Pryor, for negotiating and organising the TTTG Member access to the Bunnings PowerPass Card.

The Next TTTG Workshop

2023/24 'REAL SKILLS" WORKSHOPS PROGRAM

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FOR OUR FORTHCOMING

"Real Skills" Workshops Great Value at only $70.00

We teach real skills

Available at all TTTG Meetings Workshops & Events

TTTG Leather Chisel Rolls	**$25 each**
TTTG Sharp Oil	**$6 a bottle**
TTTG Chisel & Plane Handles	**$10 each**

Members & Friends Tool Sale Sunday 13 August 2023

Remember the date and time:

Sunday 13 August 2023 – 8.00 am to 11.00 am

Remember the location:

Old Eastwood Town Hall
74 Agincourt Road, Marsfield, NSW

Remember the entry fee:

- **$5 per person – pay at the door and please have your $5 note or $5 in coins for entry.**
- **All purchases are made in cash at the sale and so having notes smaller than $50 is a good idea.**

Want to sell some surplus tools – hire a table:

- **$25 per table – contact the Secretary to book via secretary@tttg.org.au**
- **For insurance reasons only TTTG Members can book tables – membership is $50 per year**

TABLES ARE LIMITED SO BOOK EARLY

NO ASSISTANT PASSES WILL BE ISSUED

Next TTTG Sydney Tool Sale Sunday 25 February 2024

GARVIN TOOLS

Garvin Tools manufacture a range of precision-made and engineered tools for wood working and metal working. They also design and develop tools and products in-house to customers' specifications.

Based in New Delhi, India, Garvin started making quality tools in 1979, they now export internationally, and were ISO 9001 certified in 2015. They exhibited last year at the hardware trade show in Cologne, Germany.

KavTak.com.au, based in Glenwood, Sydney, NSW, are Garvin's exclusive Australian rep' and reseller.

The selection of tools that Garvin offer is vast, and therefore, at present it's not possible for KavTak Tools to offer the entire range - although they are always expanding their range based on customer demand.

If you can't find what your looking for online at KavTak Tools, then GarvinTools.com have online brochures, etc. Find what you need, let KavTak know and they can arrange to ship it on one of their annual visits. Or if it is urgent, air freight can be arranged.

Other Online Resources

Companies with good customer support are:

Machine Tools

machineryhouse.com.au

edisons.com.au

Tooling, Materials & Hardware

EdconSteel.com.au

aimsindustrial.com.au

boltandnut.com.au

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Finding the Balance

Time, Cost & Quality

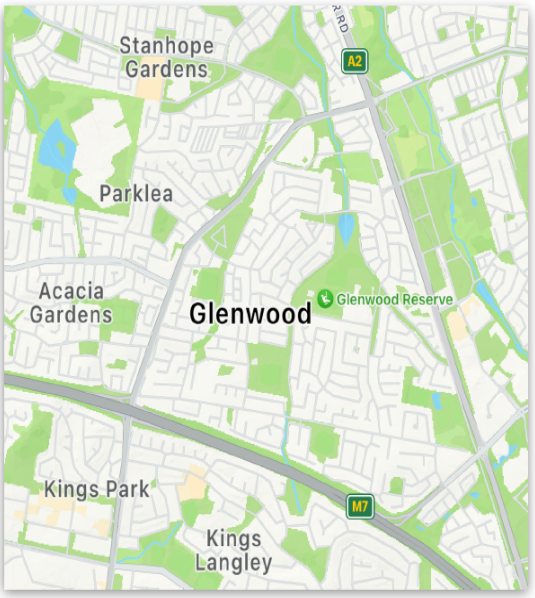
Makers are always trying to get the right balance in their own work, as well as when deciding to buy new gear, or indeed, restored gear, for their workshops.

The context at hand may sometimes require a trip to the hardware and a compromise with whatever the retailer has available at the time. But if there is enough time, waiting for local mail, or even shipping from overseas, is worth the wait.

Garvin Tools make quality products that are better priced in most cases than similar products that are made in Europe or North America.

KavTak are keen to make Garvin Tools available online to the Australian market, so check out:

kavtaktools.com.au



KAVTAK TOOLS support TTG

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Hare & Forbes support TTTG

What is TTTG

TTTG is the Traditional Tools Group; a not-for-profit group of like-minded enthusiasts interested in the history and preservation of traditional trade skills, techniques, and tools, including hand tools, vintage power tools, machinery, and other old technologies. TTTG was established in 1992.

Our bi-monthly Members' meetings typically feature a guest speaker or a panel talking on diverse topics related to tools, trades, and technology.

Keeping traditional tool skills alive is a key objective of TTTG.

"Real Skills" workshops have been held every year since 2005. These popular fee-based workshops, open to all, are designed to guide participants in developing their tool skills and learning and practising new techniques.

The Group sells old tools and machinery at affordable prices. Two or three "members and friends" Tool Sales are held each year at the Old Eastwood Town Hall, Marsfield. And every February TTTG runs Sydney's largest second-hand tools sale at Thornleigh.

Membership of the Traditional Tools Group is open to anyone with an interest in traditional tools history, techniques, and skills.

The TTTG digital magazine, creatively titled "NEWS", is published in digital form, and normally emailed to Members by Mailchimp four times a year in February, May, August, and November.

"Trad Tools" a monthly TTTG bulletin sent to registered recipients by Mailchimp every month.

TTTG Membership Rules

MEMBERSHIP YEAR

- **starts 1 July and ends on the following 30 June.**

MEMBERSHIP FEE

- **currently $50 per year and becomes due on 1 July each year. Must be paid on or before 1 August or the Member becomes unfinancial.**

UNFINANCIAL MEMBERS

- a Member who has NOT paid their Membership Fee by 1 August each year. That Member will cease to receive NEWS magazine or access to the Members' area of the website.

NEW MEMBERS

- join between 1 July and 31 March the following year and receive full Membership for the remainder of that MEMBERSHIP YEAR.
- join between 1 April1and 30 June and receive full membership until the end of the following MEMBERSHIP YEAR.

Send MEMBERSHIP inquiries and questions to secretary@tttg.org.au.

TTTG Fees and Contacts 2022/23

TTTG Fees

Annual Membership	$50
'Real Skills' Workshops	$70
Member Meetings entry	$5
Members & Friends Tool Sales entry	$5

TTTG Contacts

NEWS Magazine Editorial, Articles & Advertising:
John Bates secretary@tttg.org.au

Trad Tools Bulletin Editorial/Advertising:
Bob Crosbie president@tttg.org.au

TTTG Memberships:
John Bates secretary@tttg.org.au

TTTG 'Real Skills' Workshops:
Bob Crosbie president@tttg.org.au

NEWS Magazine & Trad Tools Bulletin

NEWS Magazine (quarterly)

NEWS Magazine is emailed to financial TTTG Members in:
FEBRUARY, MAY, AUGUST and NOVEMBER

Trad Tools Bulletin (monthly)

TRAD TOOLS Bulletin is emailed **each month** to "anyone interested" – just send us your name and email address

Next TTTG Members Meeting

Old Eastwood Town Hall
74 Agincourt Road, Marsfield, NSW

Tuesday 11 April 2023 – starts at 7.00 pm
TOPIC: The Future of TTTG

For more details see the website for details **www.tttg.org.au**

ROYAL AUTOMOBILE CLUB AUSTRALIA

INCORPORATING THE IMPERIAL SERVICE CLUB LIMITED

The RACA Motoring Group is proud to present

An Evening with a Royal Coachbuilder
Jim Frecklington MVO OAM SAIHA

Born in Peak Hill in the NSW Central West, Jim Frecklington's love for horses led him to London's Buckingham Palace, where he first visited the Royal Mews, home to the British royal family's ceremonial horses. Years later he was whisked away to London to become caretaker of those same stables.

On retirement he returned to Australia and, in 1977, coordinated the national Royal Coaches Exhibition, part of the Queen's Silver Jubilee.

Jim spent the following years painstakingly creating his first carriage, The Australia State Coach, that was completed in 1988 for our Bi-Centenary. Next, in 2014, he added the Diamond Jubilee State Coach. Both were built locally (Dubbo and Manly respectively) before they were flown to London.

It was the Diamond Jubilee State Coach that took King Charles to his Coronation.

RACA
89 Macquarie Street Sydney
Friday, June 30 - 6pm
$85 / head for a two-course meal with tea/coffee.
Drinks to your own account.

EVENT FILLING FAST
REGISTER EARLY

Call: 8273 2300 for reservations - Ask for events
Email: eventsadmin@raca.com.au
Visa Card available
Parking available at the Opera House with a short walk to the club.