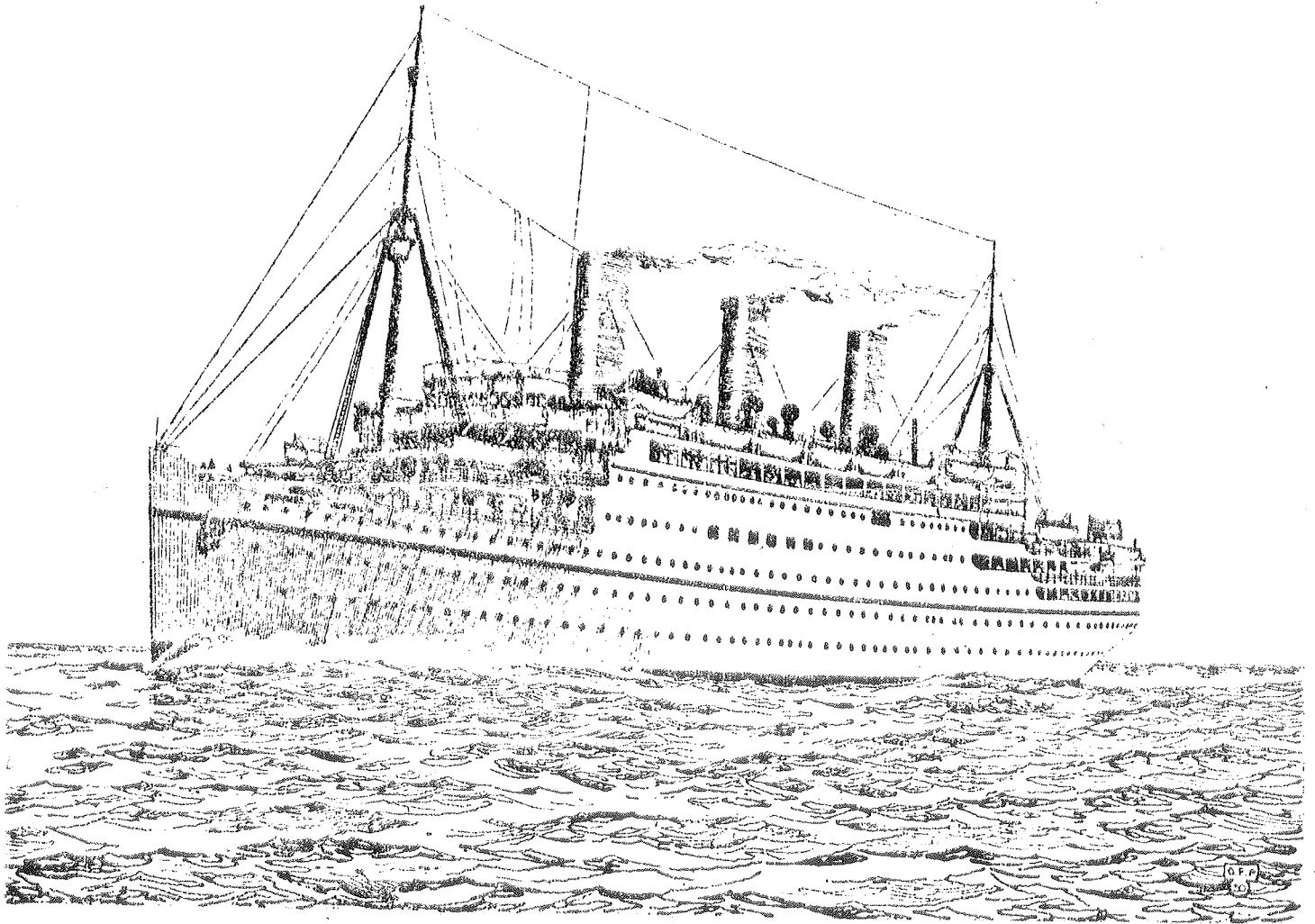


# **MAIDSTONE MODEL ENGINEERING SOCIETY**



**NEWSLETTER - Summer 1986**

---

## DATA PROTECTION ACT 1984.

Details of all members of the M.M.E.S. are currently held on computer by the Secretary for the purpose of maintaining the membership list and producing newsletter mailing labels. The only details that are recorded are the member's name, address, class of membership, whether they are a key holder, passed driver or covered for personal accident insurance.

This information is solely used within the Club and is not available to anyone outside the Club.

Under the Data Protection Act 1984, members have the right to object to this information being held on a computer, so if you wish to do so, please write to the Hon.Secretary, stating your objection.

\* \* \* \* \*

## COVER STORY.

The picture on the front cover of this newsletter has been reproduced from a drawing of the RMS Empress of Australia. The original of this drawing came to light recently, although it has been in the club for a number of years.

The club had a signalling system on the track many years ago, and a diagram of this system hung in a picture frame in the old Club hut in the days before the present clubhouse was built. This diagram was drawn by the Late Mr.E.G.Rix and was dated 1967. It was when the signal diagram was removed from its frame recently, that the ink drawing of the Empress of Australia was found to be packing out the back of the frame.

If any member knows the origin of this drawing, which has the signature of N.Pennington on the mounting, we would be interested to know its history.

\* \* \* \* \*

## NEW MEMBERS.

We welcome the following new members of the Society :

Roger Chessman, from Larkfield, who is building a 5" Simplex.

John Barrow, from Walderslade, Chatham, who is also building a Simplex.

\* \* \* \* \*

### Around The Continent In Thirty Days.

The longest railway jaunt to date began on 25th July when your intrepid correspondent departed from Snodland on the 07.03 Strood - Paddock Wood. Changing at Maidstone Barracks, East and Ashford I arrived at Folkestone Harbour to board the Sealink vessel M.V. Horsa bound for Boulogne. I was accompanied by a fellow Swansea student and rail enthusiast and between us we spoke enough foreign lingo to get by. We were armed with Inter Rail passes which for £119 gave us a months unlimited travel in 19 European countries and Morocco. Although we did not quite reach Morocco, nor indeed 14 other countries, during the month we did clock up 6,438 miles behind a wide variety of motive power.

Naturally our first taste of continental railways was the SNCF, reputed to be the best system in Europe. Certainly most rolling stock we encountered, even on branch lines, was modern. It did have the one irritating feature common throughout Europe though, the automatic folding exterior door. To open they were operated by an awkward lever and on closing did so with great force. Often the doors did not close until well out of the platform, a very dangerous situation. Plug type sliding doors as fitted to the new CIE stock in Ireland are much better.

To cross Paris we used the Metro the equivalent of the London Underground. One notable difference is that the trains have pneumatic tyred wheels instead of the normal steel ones. The carrying wheels run on two flat metal plates and smaller wheels arranged with vertical axles press against vertical side plates in order to guide the train along its track. Conventional wheels between the pneumatic tyres drop onto an emergency set of rails if the tyres deflate and they are also used at points. Here the plates drop away and the train always negotiates points on its steel wheels, returning to the tyres afterward.

This system is comparatively new and before its introduction the Metro ran on steel track in the normal way. Improved acceleration and quieter running are the main benefits but I would have thought that increased costs due to higher rolling resistance (and therefore greater energy consumption) and tyre wear would negate these to a large extent.

Our first destination was Le Mont Dore in the Auvergne region of central France reached by an overnight train from Paris Gare de Lyons (the equivalent of Euston but owing more to St. Pancras in style). Standing in the head of a valley the town is overlooked by the 5,800 ft peak of Puy de Sancy. The first stage in its ascent was by an ancient funicular railway which uses two creaking wooden cars. Each counterbalances the weight of the other so that the strain on the winding motors is reduced. A passing place half way up seemed to have no moving parts in its pointwork so I can only assume a special arrangement of the flanges prevents a collision.

The largest part of the ascent was by cable car however. This reaches a station close to the summit. The precipitous nature of the mountain allows nearly the entire journey to be covered in one span in the middle of which the cars are several hundred feet above the ground. The journey down proved to be more eventful than that up.

Conditions on the summit were very windy. We returned to the station just as a member of staff was bellowing some incomprehensible French through a megaphone. In the wind only one word "ferme" (meaning "close") was heard, but that was enough! We boarded the last descent of the day. As soon as the car cleared the station the wind caught it and it dropped alarmingly as the cable took the strain. An inclinometer inside registered 15 degrees in some gusts so all concerned were relieved to set foot again on terra firma.

One anachronism noted in this area is the provision on some secondary main-

lines of new semaphore signals of the swivelling board type, face on for danger edge on for clear, a system abandoned a century ago in Britain. These signals certainly made a sharp contrast with the modern diesels running past them.

The flagship of the SNCF fleet is of course the TGV, at 168 mph, the fastest passenger train in the world. Unfortunately we never had a chance to try it out, but from the outside it looked a bit cramped, with airline style seats. This train requires a supplement as do most high speed services in Europe apart from BR's HST. With the Channel tunnel being built we may yet see a hybrid TGV in Kent!

By contrast we did travel on SNCF's only narrow gauge line "Le Train Petit Jaune" which roughly translates as The Little Yellow Train (because of its livery). High in the Pyrennees near the Spanish border it runs from La Tour de Carol to Villefranche. The trains are six to eight car units on metre gauge and electrified at 800 V dc third rail. Any similarity to Southern Region ends there! It would be the worlds longest roller-coaster but for the fact that the intermediate stations are used by locals for their everyday transport. At Font Romeau the line reaches the highest station in France and falls over 3500 ft in the next 20 miles at a ruling gradient of 1:20 with a maximum gradient of 1:14, all worked by adhesion only. The curvature of the line is tortuous with 180 degree turns in only 3 times the length of the train. The line clings for many miles along its 1:20 section to the edge of a precipitous gorge hundreds of feet deep, twisting and turning and occasionally passing through tunnels in the cliff face. It also crosses a spectacular viaduct and what must be one of the highest railway suspension bridges in Europe. According to a recent report in "Railway World" the maximum speed on this line is 37 mph and that only for a few miles. Our train, however, easily reached 60 mph on the straighter stretches. Passengers had to brace themselves and their luggage against flying about in (or out of!) our open coach. I was not the only one slightly relieved to reach the terminus in one piece, but on time (thus confounding our theory that the driver was on a suicide mission). This line is not to be recommended for those of a nervous disposition. Altogether more sedate however is the Vivrais line in "Le Midi", the centre of France.

Railway preservation is much more common in Britain than on the continent. Many of those projects which do exist there don't attempt to recreate the whole railway in the broadest sense as in this country. The object is to run steam trains and no one is much bothered about authentic stations and the like. Such a line is the Vivrais.

We arrived at Valence SNCF station in search of an advertised bus to Tournon the Vivrais terminus but missed it because French buses don't clearly display their destination. This left a slim chance of getting the one steam train of the day, the 10.00, off of the next bus due to arrive at 09.55. It actually arrived at 09.58 followed by a two minute dash toward a column of rising steam and smoke. This is the only occasion on which I have boarded a moving train (definitely not to be recommended).

Dual metre / standard gauge track is shared with an important SNCF freight line for a mile before the train swings off into the hills on its own. The Vivrais line is fairly steeply graded with one intermediate station on its two hour run. It is really only there for watering the loco (and the passengers in the hot conditions prevalent). The route includes several large viaducts a few tunnels and is partly along another spectacular gorge.

On reaching the upper terminus of Lemastre we had an opportunity to examine the loco, an 0-6-6-0 T of the compound Mallet type. The loco used to operate on the line during the 1960's. It was in rather a poor state of cleanliness.

This was partly due to the peculiar fuel used, coal grains compressed into bricks supplemented by shovel fulls of this "black sand". It got everywhere and why the whole lot didn't go straight up the chimney I don't know. After a two hour lay over at Lemastre the loco was turned for the journey back to Tournon. Here were shedded a wide variety of locos, some not original to the line, which closed in the 1960's to CFD (Chemin de Fer Departmentaux) traffic. There were also some narrow gauge diesel railcars of 1930's vintage, reflecting the style of the times in their streamlined bodywork. Quite what speeds were envisaged is not known!

After France Italy was the next venue, travelling via Switzerland. Following nine hours on the floor outside the lavatory between Berne and Venice we concluded that international overnight trains are bad news as they are packed in a way that no sardine tin ever has been. Although Italian State Railways (FS) rolling stock is not as bad as it is cracked down to be it merits little mention here. One peculiarity of Italian mainline electrics is that whilst most modern locos have a rigid frame carried on two bogies these locos are articulated with two rigid frames coupled back to back (a flexible curtain covering the joint).

The city of Venice was certainly crowded but whether there were more tourists or pigeons is debatable. Queues to see inside the sights were endless so we didn't bother. Relief came by escaping from stifling Venice to elegant Vienna.

The Austrian capital was the most pleasant and cleanest city we visited and of considerable interest from the urban railway viewpoint. Many European cities have not forsaken the tram but developed it into a high technology urban transport system. (West Yorkshire is incidentally planning a tram come back of its own with a new line line across Sheffield). Vienna has a plethora of public transport which includes suburban services on the mainlines and the Schnellbahn two cross city lines operated by OBB (Austrian State Railways). The Strassebahn is the street tram system running either as single or double cars and the Stadtbahn is a system of larger trams running on stone viaducts down the centre of wide avenues and underground in the city centre. There is also the recently opened underground system, the U-Bahn. At each stop on all these services recorded information is played concerning interchanges with the other modes of transport. Finally of course we must not overlook the buses. The network is clean, efficient and well patronized. Consequently road congestion and noise is markedly lower in Vienna than in London or Paris.

Vienna's famous amusement park, the Prater, has a 15" gauge line two miles long running through it. Steam Pacifics were in use at weekends but diesels were running that day so we took a trip on the Ferris wheel of "The Third Man" fame. This is the largest in the world at 197 ft in diameter and provides an excellent view over the city during its ten minute ride.

The 760 mm gauge Zillertalbahn is probably the most famous narrow gauge steam/ diesel operated line in Austria. Its lower terminus is Jenbach in the west of the country on the Vienna- Innsbruck line. Mayerhofen, the upper terminus, was our destination but the weather was against us. In these Alpine areas special channels are cut to direct snowmelt during the spring thaw safely into the rivers. For a few days in August rainfall was so heavy that it exceeded the capacity of even these channels and one overflowed below the Zillertalbahn washing it away. This terminated our D-6-2T hauled train at Kaltenbach. Fortunately accommodation was available in a local guest house. By the following day a wash out had occurred down the valley as well, stranding an early train. A Zillertalbahn bus took us to Jenbach for an OBB train to Innsbruck to visit the Tyrol Museum where amongst other exhibits were veteran

locos and trams. Unfortunately this building stood by the River Inn and said exhibits were axle deep in mud!

A few days later the raging torrents subsided and normal working resumed. Transporter wagons (diesel hauled) were much in evidence. These are narrow gauge wagons with standard gauge ones astride them thus obviating costly transshipment. A long pipe serves as the coupling between the transporter wagons preventing the standard gauge wagons buffers coming into contact and perhaps locking on sharp curves. Being hollow it also serves as the brake pipe. Naturally the whole arrangement is somewhat top heavy and consequently speeds are no more than 15 mph for freight trains. Commodities from hay to bulk cement were seen in transit which illustrates the relative importance of rail transport on the continent. Marshalling yards are common and most stations have sidings, usually in use. The Juggernaut rules only Britannia it seems.

Jenbach boasts two steam termini the other being that of the Achenseebahn rack railway operated by 0-4-0 T's. These engines have an inclined boiler, like those of the Snowdon Mountain Railway, to compensate for the 1:5 gradient on the main rack section. They push one or two coaches up the rack section to the summit, the end of a tributary valley to the main Ziller. The loco then runs round and pulls the train on gentler adhesion only gradients down to Seespitzen where a steamer plys the glacial lake.

The locos transmission is quite unusual. Outside coupling rods drive a crankshaft in the opposite direction to the wheels. By gearing this is connected to a second crankshaft which drives the main coupling rods (two on each side not in a line) by a crank. It looks even less likely to work than it sounds but it does!

Holders of Inter-Rail cards often get reduced or free admission to museums and we took full advantage of that. In Vienna the equivalent of the Science Museum has an extensive and varied display of locomotives, both full size and miniature, chronicling the railway story in Austria from the earliest days. We were pleased to see that due regard was paid to Herr Trevithick und Herr Stephenson. The Swiss Transport Museum is in Lucerne and its exhibits range from cable cars to aircraft. In the Railway Hall is a steam shunter of the 1890's designed for one man operation. What would ASLEF think of that then or now? Also represented is the last Swiss steam design, a heavy freight 2-10-0 with outside Walschearts valve gear and a wide firebox, built not in 1960 but in 1913. Since then almost total electrification has been achieved and the system now runs, for want of a better term, like a Swiss watch. Lucerne also has a large trolley bus system. The phenomenal acceleration of these buses certainly caught me out when riding standing from the station to the museum.

Many of the SNCF's finest steam designs are present at their NRM in Mulhouse. These museums have most of their exhibits captioned in several languages which is helpful for linguistic duffers like me. The size of French express steam locos, such as the Chapelon 241P 4-8-2, is massive but as Mr Churchward rightly said it is watchmakers work in its detail. An unexpected find was a Southern wagon "Not to be worked between Tonbridge and Hastings" for use on international traffic. York, said the caption, has the SNCF equivalent.

Undoubtedly the most interesting area visited was around Gmund in North East Austria near the Czech boarder. Gmund shed houses standard and narrow gauge (760 mm) diesels and narrow gauge steam locos. The latter consist of eight or so 399 class 0-8-0's and one 0-6-2T. These operated all services on both narrow gauge branches until the diesels arrived recently. Now steam working is confined to the southern line at weekends and when diesels are unavailable. The system is certainly a working railway and being a part of OBB we were al-

lowed unlimited travel over it.

The wide rolling plains of the region give it very much an East European flavour and at one point the line actually forms the "Iron Curtain" itself. Damage in the Second World War was heavy and afterwards the area was in the Russian occupied zone for a while. Along the line they restored the ruined town of Weitra to its former glory rather than rebuild in the modern style as the other Allies did elsewhere. The result is a picturesque town which attracts many visitors, mostly Austrian themselves. To each restored building is fixed a plaque of dubious value which reads "Property of cultural and architectural significance - not to be used or damaged in the event of war". Written in English, French, German and Russian they are obviously hedging their bets about the next aggressors nationality.

Steam trains were exclusively in the hands of the 399 class locos whilst we were there, although we later read in the "Railway Magazine" that the 0-6-2T had been in charge. Again it just goes to show that you can't believe all the reports you read (except this one naturally!). The line runs to Gross Gerungs 25 miles distant and climbs most of the way after the first 5 miles. Near Weitra the line describes a loop to gain height quickly and the locos must put in some hard work, especially as weekend trains are strengthened to 10 coaches or more. Two restaurant / buffet coaches are included for the benefit of visitors but the staple traffic of the line remains the local people and their produce. Foreign visitors to Gmund are evidently not common as the guard had never seen an Inter-Rail card before and in the Youth Hostel in which we stayed (as the only guests) no British visitors had been there in the past three years.

As with the Zillertalbahn transporter wagons were much in use for permanent way and freight trains mostly carrying grain from the wheat fields that stretched for miles in all directions.

The line had not escaped the notice of the more dedicated, determined or lunatic (depending on your viewpoint) steam "gricers". You noticed them photograph the train soon after leaving Gmund and then dive into their cars and race off. A few miles up the line there they were again for another picture before tearing away for the next relying on station stops and quiet roads to put them in the lead. Of course they could not stray far from their cars as they would not get to the next location in time. As the best scenery is away from the roads being a "gricer" and obtaining such a view is impossible. Not so for those on the train however. Deep in the forest Bruderndorf halt was really only there as a watering stop for the loco. A tunnel follows straight after the station so we were able to run over the hill whilst the loco was taking water and photograph it leaving the far portal in dramatic style. Smoke continued to trickle out of the tunnel for as long as 20 minutes after the train had passed.

The most memorable incident of the whole journey occurred here on the Gmund line. One morning in our remote guest house near the line I was woken at 5 AM by a steam freight whistling over a level crossing. In the rural quiet it could be heard for 15 minutes as it pounded up the loop to Weitra - a whisper of the real steam age.

Time was running out however and we had to head for Blighty by means of Vienna, Basel (just clipping Germany), Paris, Boulogne and Folkestone arriving at Snodland on the 14.15 Maidstone West - Strood on 23rd August. What of the cost you may ask. £300 for four weeks or less than 5p a mile all in. Beat that on a package tour!

PAUL  
CLARK

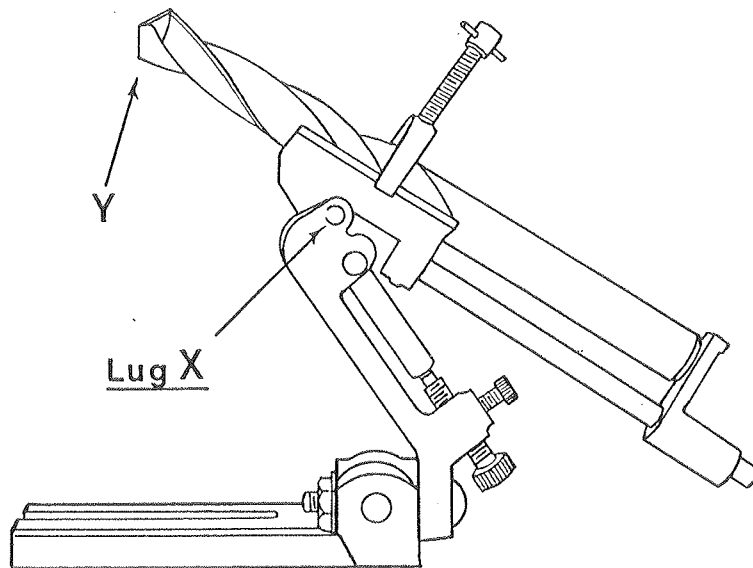


Fig 3

"RELIANCE"  
Drill grinding jig  
showing modification  
for four facet sharpening

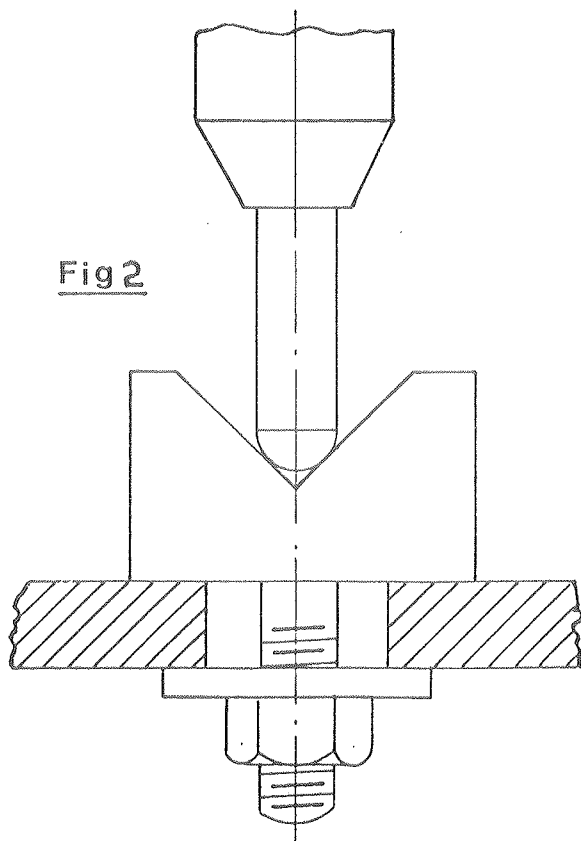


Fig 2

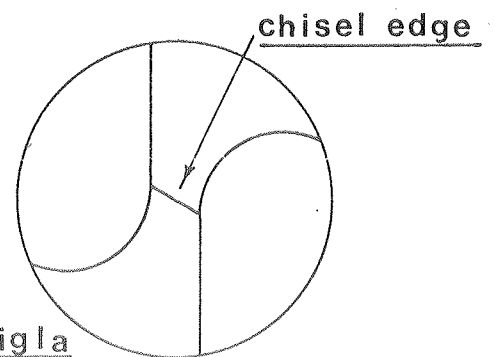


Fig 1a

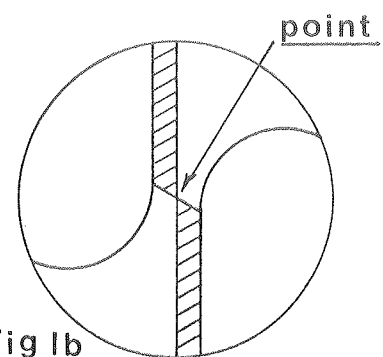
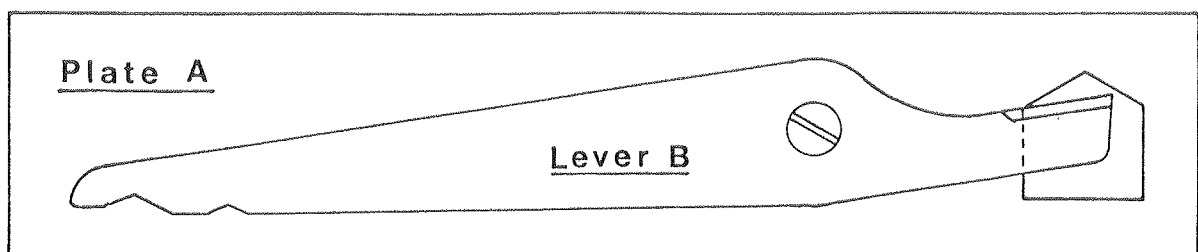


Fig 1b





## Sharpening Drills

by  
J. Ewins

There recently appeared in the Model Engineer an article on sharpening drills by the Four Facet method using the Quorn cutter grinder. Not many of us have a Quorn but some may have the Reliance drill grinding jig which with a very small modification can be used to produce the four facets.

Four facet sharpening has the advantage that instead of the usual chisel edge across the tip of the drill a point is produced which will locate in the finest centre punch indentation and cause the drill to start accurately at that point. Indeed even if there is no punch mark the drill will start precisely at the point where it first contacts the work without any tendency to wander such as is experienced with normal sharpening. Later I will describe how this property can be exploited to cross-drill a circular shaft with a diametral hole.

Fig 1a shows an end view of a drill conventionally sharpened and below this the modification when four facets are produced. When drills are sharpened with the Reliance device the backing off necessary to allow the drill to enter freely into the cut is in the form of a conical surface with its axis inclined to that of the drill. With the method about to be described this conical surface is modified at the cutting edge by the formation of a flat section extending to the centre of the chisel point. This gives a result slightly different from that given by the Quorn method which uses two flat surfaces but the end result (sorry for the pun) is the same. For normal sharpening, the drill is placed in the trough of the jig with three times its diameter projecting which gives a backing off angle of  $9^\circ$ . Less projection results in greater backing off and for the present purpose  $2\frac{1}{2}$  times is about right. The drill is sharpened with this adjustment by following the procedure usual for this device. Now for the small modification to the equipment. Fig 3 shows a side view of the apparatus and marked on this is the lug 'X' which forms the stop to ensure that the grinding is limited with respect to the cutting edge so as to provide the desired  $9^\circ$  clearance. Through the centre of this lug is drilled and tapped a 2 BA hole which is fitted with a screw having a pair of back nuts locked together to form a stop to limit the projection of this screw against which the drill carrier abuts to limit its travel. The drill carrier is now returned carefully to occupy the position determined by this stop and the feedscrew advanced slightly to cause a cut to be taken against the grinding wheel. Inspection with a watch-makers glass will reveal whether sufficient cut has been taken to extend this flat halfway across the chisel edge. When this is satisfactory the drill is turned  $180^\circ$  and the other facet similarly treated. The projection of the 2 BA screw can be determined by trial and influences the clearance angle at the cutting edge but on my jig which is a No 1 size ( $\frac{1}{8}$ " to  $\frac{1}{4}$ "), it is about  $3/32$ "

As mentioned above a drill sharpened with four facets will start cutting just where it first touches the work even if the surface is cylindrical and use can be made of this property to drill holes diametrically through cylindrical components. The set-up I use for this is shown at Fig 2 where a vee block is fastened to the table of a drilling machine accurately in line with the axis of the machine. This can be achieved by using a spherically ended mandrel as shown locating in the vee of the block which can be fastened in various ways depending on the availability holes or slots in the table and whether one wishes to set aside a block for this purpose. It might for instance be convenient to fix the block to a flat plate (Loctite ?) and to clamp this in turn to the table. I find it necessary to make several spherically ended mandrels of different lengths to allow for different drill lengths because having once adjusted the position of the vee block one cannot alter the height of the table without destroying this adjustment.

Another device I have found useful for use with the Reliance is shown in Fig 4 which facilitates the initial adjustment of the drill in the trough with the correct length projecting. It consists of a plate 'A' on which is pivoted a lever 'B' having notches at its left hand end placed in such a position that when a drill is inserted in the vee shaped hole in the right of the plate the distance from the lower edge of the plate is  $2\frac{1}{2}$  or 3 times the drill diameter depending upon the notch chosen. I have worked out the geometry in such a way that the accuracy is acceptable over the range covered by the No 1 Reliance ( $\frac{1}{8}$ " to  $\frac{1}{2}$ ") and if one is considering making the device it would be convenient to trace the outline of the plate and lever from the drawing. The plate is suitably  $\frac{1}{8}$ " mild steel and the lever  $\frac{1}{16}$ " thick material although in my own case the plate is the angle iron edging to the bench top adjacent to the grinder.

There is no doubt that using a grinding jig to sharpen drills is greatly preferable to 'off hand' sharpening although I must confess that occasionally I indulge in the latter practice when it is just a case of touching up the cutting edges. Never-the-less when I have a session of sharpening I do find the Reliance very effective and quick and I defy anyone to produce the same accuracy off-hand!

C J.E. 6/86.

=====

MAIDSTONE MODEL ENGINEERING SOCIETY OFFICERS 1986

President	A.H.W. Payne Esq (Jack), 38 Oxford Road, Maidstone, Kent, ME15 8DJ, Maidstone 57545,
Chairman	G.Kimber Esq (Graham), A The Stream, Ditton, Maidstone, Kent, West Malling 845931,
Vice Chairman	P.J.A. Chislett Esq. (Peter), 30 Manor Rise, Bearsted, Maidstone, Kent, ME14 4DB, Maidstone 37407,
Secretary	M.N. Parham Esq. (Martin), Bramleys, Old Loose Hill, Loose, Maidstone, Kent, ME15 0BS, Maidstone 44175,
Treasurer	P.A. Roots Esq. (Pete), 97 Tonbridge Road, Maidstone, Kent, ME16 8JN, Maidstone 58599,
Press Officer	Mrs S. Gurr (Sue), 28 Claremont Road, Vinters Park Estate, Maidstone, Kent, ME14 5LZ, Maidstone 678903,

Committee

Norman Clark, Adrian Gurr, Don Paterson, Geoff Riddles, Robin Spencer  
and Chris Williams,

=====

DIARY SUMMER 1986

Saturday July 5th : Open Day.

Friday August 1st : Fish'n'Chip Night and Evening Run.

Saturday August 30th : Visit to Sutton Club.

Friday September 5th : Evening Run and Fish'n' Chip Night.

Please support Club Events, especially the Open Day. All contributions of food, help, exhibits etcetera will be appreciated. You will have noticed that the August and September Club Nights are the same events - this is in the hope that we shall have at least one fine evening!

[illegible]

## IMPORTANT NOTICE TO DRIVERS REGARDING INSURANCE

Due to circumstances beyond our control any person driving a locomotive WHO IS UNDER THE AGE OF SIXTEEN may NOT be permitted to drive as they are NOT covered by the Club Insurance.

This was recently brought to our attention by the Southern Federation through whom we obtain our insurance and until we are unable to investigate the situation further the above condition must be respected.

[illegible]

REQUIRED BY THE CLUB>REQUIRED BY THE CLUB>REQUIRED BY THE CLUB>REQUIRED BY CLUB>

Upwards of two horse power single phase motors needed for the Workshop>>>>>>>>

Half inch water pipe and five foot or six foot long steel scaffold poles for fencing.

[illegible]

