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Vol.199 No. 4304

20 July – 2 August 2007

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(Photograph by Neil Read)

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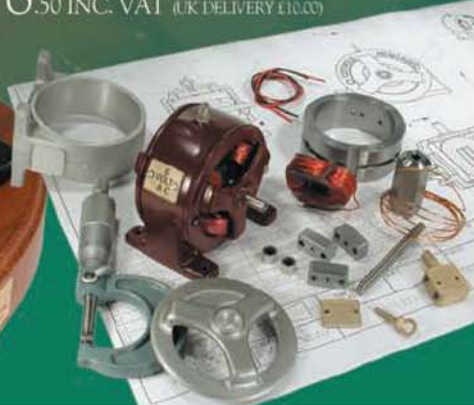
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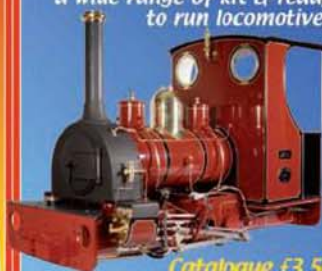
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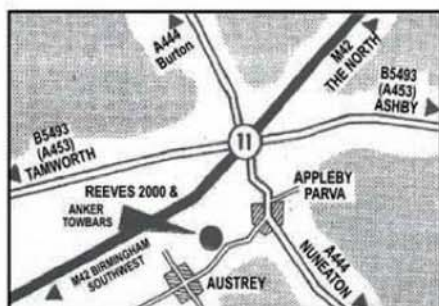
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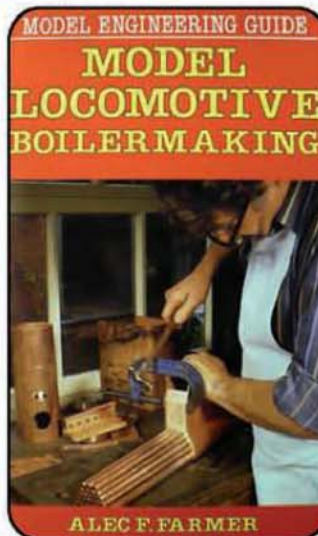
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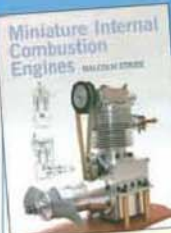
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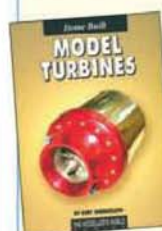
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• Stride • £22.95

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Home Built Model Turbines

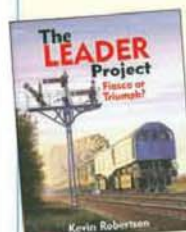
• Schreckling • £16.60

Kurt Schreckling started developing model turbine engines over 30 years ago, since when the pace of development has increased, and the range of complete kits, or parts for engines has mushroomed - all providing an excellent basis for homebuilding. This book illustrates technical principles and provides extensive drawings, photographs and instructions to help the committed model-maker to build his own model of the KJ-66 and TK-50, as well as the J-66 kit-version turbine from Behotec. Another turbine book you must have! 101 heavily illustrated pages. Paperback.



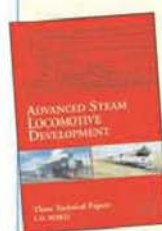
Katie's Other Sisters • Buck • £ 7.95

A follow-up to the now out-of-print *Sian and Katie - The Twining Sisters*, here Stan Buck looks at the looks at the five engines built by Trevor Guest to the designs of Ernest Twining - a small but very influential group as, whilst there has been an explosion of new 15" gauge engines since 1964 when the last Guest/Twining engine appeared, only one has been to 'standard gauge' outline, all the others following Twining's narrow gauge outline ideas exemplified in *Katie, Sian and Tracey Je/Wroxham Broad* - but none so elegantly. Lots of background information on the two men, good text and 12 b & w photos, 32 colour photos and 3 drawings. 58 pages. Paperback.



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• Porta • £11.80

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Institution of Locomotive Engineers in March 1969 entitled *Steam Locomotive Development in Argentina - its contribution to the future of railway technology in the under-developed countries*. The third paper is, again, a private one, and deals with the subject of steam leakage. This book must be read by anyone operating or maintaining a steam locomotive today, and it should also be required reading of anyone who believes that the steam locomotive couldn't be developed further. There are so many, usually remarkably simple (or obvious), but mind blowing concepts here that this book will challenge all your ideas! 104 pages. 20 B & W photos. 53 drawings, graphs & tables. Paperback.

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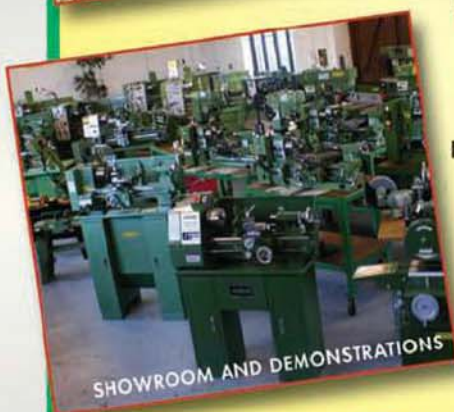
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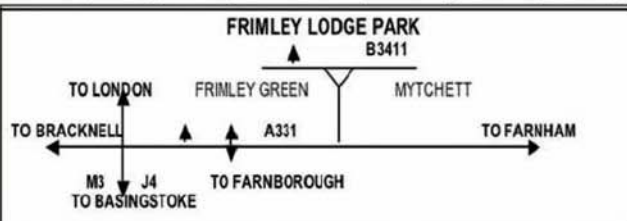
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Harold Hall is the best-known designer of workshop equipment for model engineers today. He has been a regular contributor to *Model Engineer* and *Model Engineers' Workshop* for a number of years. He has also written many books on the subject and these have proved popular with beginners and experienced alike.

Harold's approach is supremely practical, and many have adopted his methods and made tooling to his designs. On display will be pretty well all of his output in ready-to-use condition.

The late George Thomas was a fine toolmaker. His many series of articles in the 1970s and 80s have been among the most popular that *Model Engineer* has published.

George produced many original designs, and he improved and modified the designs of others.

The entire collection of his tools passed to Bob Studer, who is kindly loaning them for the Ascot exhibition. Visitors will be able to see not just the excellence of the designs but also the very fine workmanship involved.

Among the dozens of items on show will be his Universal Pillar Tool, the Versatile Dividing Head, retracting top-slide, ball turning tool and boring tools of every type and size, right down to the smallest ever to have been seen in a model engineer's workshop. All that plus some special designs produced for one specific job will be on display.

For latest exhibition news visit model-engineer.co.uk

Snap up a prize

Earlier this year, we asked



Malcolm

Stride to produce a series of articles entitled "Digital Photography for Model Engineers".

Many model engineers are keen photographers, and we thought it was the right time to produce a guide to clarify many points that seemed to be causing problems. For example, we receive many electronic files of 72dpi. That sort of resolution is fine for displaying on a computer, but not much use for printing. Our standard is 300dpi minimum.

Then there is the relationship between image size and resolution. It is easy enough to convert a 72dpi file to 300dpi. However, in the process it will probably be reduced to something about the size of a postage stamp. Again not a practical proposition for printing.

To be honest our initial motive in wanting that short series was to help inexperienced contributors to provide us with useable photos. At the same time we thought it would be useful to make it a comprehensive guide on how to get the most out of your digital camera when photographing models.

Having done that, we thought we would put Malcolm's efforts to the test, and organise a competition. Full details can be found on page 76. Some of the best will be on display at Ascot in September, and reproduced in *Model Engineer*.

Good luck!

Win a trip to the Monaco Grand Prix

Model Engineer and Dremel, official suppliers and sponsors of the Spyker Formula One Motor Racing Team, have organised a competition to build a model to take part in a model car Grand Prix at Silverstone later in the year.

You could go on to win a trip

to next year's Monaco Grand Prix.

If you have to do is email megrandprix@magicalia.com, or send in, the name of the home of F1 in the UK plus your email address, name and full address. The clue is in this competition.

If you get this correct and are one of the first 50 entries to be received, you will receive a Dremel F1 pinewood model car kit.

Once you receive it, you need to assemble the kit and choose your racing colours - it is all about good looks at this stage. Creator of the best looking model, plus a guest, will win the opportunity to go behind the scenes at Silverstone, see the Spyker F1 car up close, meet one of the F1 drivers and take part in the model car Grand Prix.

Overall winner at the Silverstone final will win a once in a lifetime trip to the 2008 Monaco Grand Prix.

Guildford this weekend

A reminder that this weekend, July 21 and 22, sees the Guildford Rally. It is one of our favourite events of the year with plenty going on as well as a good display of models in a marquee.

A highlight is always the traction engine arena. Dozens in all shapes and sizes are put through their paces. Two days of pure enjoyment.

A good number of locomotives are always in steam in all gauges, with plenty of visitors adding to engines from the Guildford Society.

Plenty of I/C engines, too.

Although it is a club event, the organisation is highly professional, and a number of leading traders are usually in attendance.

The Guildford Society operates from Stoke Park to the east of Guildford, and is easily accessible from the A3, and therefore, from the M25. Also from the A25.

Entrance is £6 for adults, £5 for senior citizens and free for children under 16. For more details of this super event see: www.gmes.org.uk



Metric thread standards

SIRS, - Phillip Bellamy in his letter (M.E. 4295, 16 March 2007) refers to my Bottle

Frame Engine with metric threads and metric threads in general and the problem of availability and the large heads on the smaller standard metric hexagon head bolts and screws.

Small head hexagon bolts, screws and nuts are available from Polly Models who also market most of the castings for my model stationary engines. I do not have the names to hand but they are also available from suppliers in Germany and France.

The requirements for a standard range of metric fastening threads and model engineering fine threads, was foreseen by leading members of the model engineering fraternity in the late 1970s and a working party was set up under the sponsorship of MAP Ltd. then publishers of *Model Engineer*. This committee submitted their final report in

1981. For procedural reasons it was not adopted as a true 'British Standard' but it was considered sufficiently important to be issued by the BSI as a 'Published Document' in 1982 as PD 6507-1982.

It has been covered in *Model Engineer* a number of times, the latest in M.E. 3991, 21 April 1995. It gives all the 'model engineer standard metric threads' you will want including the hexagon sizes so there is no need for anybody to supply non-standard metric thread screws and nuts including the hexagon sizes.

All the threads and pitch sizes chosen came from standard ISO threads and pitches. Perhaps it is time for *Model Engineer* to reprint the article from 1995 for those new to the hobby and who may not be aware of these standard metric threads for model engineers.

Whatever we may think about metrication it is going to end up a metric world, there is little point in fighting a rearguard action it is doomed to failure. It is often asked how we can introduce a younger element into the hobby,

why put obstacles in their way with a measuring system that is alien to them. I hope that model engineers in 50 years time will still be building some of the designs being produced today as we are of designs already 50 years-old. But for some of today's designs they will have to convert first from imperial fractions into imperial decimals and then into metric. What a pain!

While talking about 'Standards' there is one I have not seen published and mentioned by Phillip and that is the sizes of hexagons and threads for steam fittings, pipe nuts and olives, be it imperial or metric.

I have drawn up a chart, which hopefully will be published with this letter, perhaps readers could send in copies filled in so that a consensus can be established. It would be nice if we were all singing from the same hymn sheet especially when only metric fittings are available. I have only filled in a few columns, as that was all the commercially made nuts I had to hand.

I know some injector manufacturers are supplying the Continent with metric standard injectors. Perhaps they could be kind enough to tell us what metric threads they are using.

I smiled when I read Peter Black's letter (M.E. 4296, 30 March 2007) and the comments made to him at the start of his course. Many years ago when I started work, on the first day I was told "go and get an office job, anybody who takes their jacket off to start work will never make any money", the advice was correct. On the other hand I have enjoyed myself immensely at work and have looked forward to each day, so there is a reward even if it is not monetary.

As to what is an engineer, I would suggest that is the person who dreams up the project, does the design and solves the problems. It is the machinist/mechanic who makes the thing.

Anthony Mount, Devon.

STANDARD HEXAGON NUTS FOR PIPE CONNECTIONS							
IMPERIAL NUT DIMENSIONS				METRIC NUT DIMENSIONS			
PIPE DIA.	HEXAGON A/F	THREAD TPI	NUT LENGTH	PIPE DIA.	HEXAGON A/F	THREAD PITCH	NUT LENGTH
1/16in.				1.6mm			
3/32in.	1/4in.	3/16in. x 40	1/4in.	2.5mm			
1/8in.	1/4in.	3/16in. x 40	1/4in.	3mm			
5/32in.				4mm			
3/16in.	3/8in.	5/16in. x 26	0.300in.	5mm			
7/32in.	3/8in.	5/16in. x 26	0.300in.	5.5mm			
1/4in.				6mm			
9/32in.				7mm			
5/16in.				8mm			
3/8in.				10mm			
7/16in.				11mm			
1/2in.				12mm			
9/16in.				14mm			
				15mm			
5/8in.				16mm			
3/4in.				20mm			
7/8in.				22mm			
1in.				25mm			

Static electricity from steam

SIRS, - I have just noticed the letter from Mr. C. Wood (*M.E.* 4295, 16 March 2007) asking for information on the subject of generating static electricity by means of a jet of saturated steam.

If Mr. Wood is seeking to date this discovery, the date must precede that of the book which he mentions (1860) but be later than the establishment of railway services in the town mentioned (Sedgehill near Newcastle) in the enclosed photocopies.

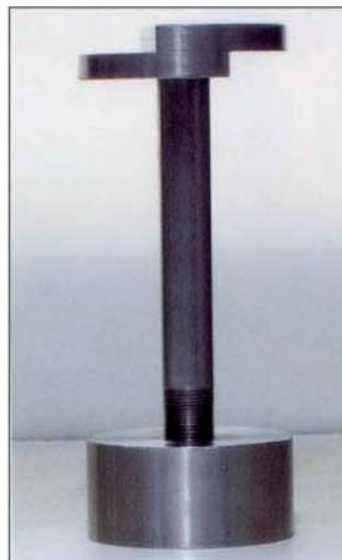
Incidentally, I find it hard to believe that sufficient power could have been developed by a comparatively primitive type of motor running off primary cells to propel a 28ft. boat at 4mph.

M. J. H. Ellis, Bristol.

Tool height gauge

SIRS, - Many years ago, faced with the need for extreme accuracy in concentricity, I realised that if an outer surface is machined with a tool in the front tool post then the bore should be machined, even screw cut, with a tool upside down in a rear tool post. The problem of tool height I solved by making a device similar to that described in *M.E.* 4297, 13 April 2007.

Bill Kirshner's tool height gauge for both front and rear tools.



The photograph needs little explanation; adjustment is provided by the lower end of the $\frac{3}{8}$ in. diameter post being screwed 40tpi, mating with the threaded base and four longitudinal slits in a 2BA internal thread (taper tap) with a screw to tighten the fit with the base.

Bill Kirshner, Cheshire.

Three-phase supplies

SIRS, - Referring to Mr. Gregory's letter (*M.E.* 4298, 27 April 2007) whilst it is, of course, always desirable to employ a qualified electrician, I for one, would like to see some statistics on fires caused by amateurs. As with so many things these days, the possibility of fire is used as a stick to beat those wanting to do something for themselves. The information I have suggests most electrical fires are caused either by an appliance itself, or by a trailing flex which has become worn by constant plugging and unplugging, and very rarely by the installed static wiring.

The main problem facing amateurs now is that all new installed wiring has to be certified by a qualified electrician as part of the building regulations; whether this applies to temporary wiring is possibly open to argument.

However, my main point concerns the scenario where the portable generator could feed back through the local step down transformer and endanger the restoration crew! Unless yours is the sole property fed from the local step-down transformer, as might conceivably happen in the depths of the country, all that would happen if you failed to isolate your own supply at the incoming breaker, would be that your generator would endeavour to feed every house in the street. Dependent upon the fusing arrangements, the generator would either stall, or blow its own or possibly the company fuse.

As for the repair crew, when I was involved in such work (albeit some 20 or so years ago), such supply cables were

isolated at both ends and invariably earthed before the start of repair work - possibly things have changed, but I somehow doubt it.

I also understand it is very rare for the supply authority to be prepared to provide a three-phase supply to a private property, and judging by the experience of a friend who runs a small business and who recently made enquiries about such a supply, the cost would be prohibitive.

On a totally separate subject; regarding the discussion on 'soft drink pressure vessels'. When I was working, all pressure vessels were tested on a regular basis (I believe by the insurance company). These days anyone can buy a compressor with an air tank from the local DIY or tool shop, but I can't recall ever having seen any references in *Model Engineer* (or anywhere else) to the possibility that these also might need to be tested on a periodic basis.

Brian J. Edwards, Buckinghamshire.

Sound control

SIRS, - Recently, whilst browsing through some old copies of the late-lamented quarterly magazine *Light Steam Power*, I came across a brief, but fascinating, report on the 1951 *Model Engineer* Exhibition.

The contributor's interest seemed to centre mainly round the 30 x 40ft. marine demonstration tank and I was intrigued to learn that "unfortunately, the author was unable to observe the manoeuvres of a perfect model of *SS Port Brisbane*, controlled by submarine sound transmissions."

It would be interesting to know whether any other readers recall this model and, better still, can explain how this amazing sounding control system actually worked.

Steve Taggart, Stamford M.E.S.

Nano engine drawings

SIRS, - Can I express my thanks to all those who responded with information on the above engine. I now have all the info.

that I need and hopefully will now be able to go ahead and construct one for myself. I have attempted to thank all those who so kindly contacted you and that you forwarded onto me. But perhaps you could place a line in *Post Bag* thanking those that I'm sure I have missed. Many thanks.

Jim Lake, by email.

Electrical regulation

SIRS, - I was pleased to see the letter from Peter Gregory that balanced much of the anti-electrical regulation correspondence that has appeared in various magazines. In one instance a quip (tongue in cheek maybe) that one may soon need a PhD to wire a 13A plug.

Having an electrical background I have for many years received from friends and relations a stream of appliances needing attention. Whilst not always the cause of the problem; I was frequently appalled at the standard of the plug connections. Typically non-functioning strain relief, outer sheaf of cable stripped back outside the plug. Two very frightening faults were the fuse, invariably 13A where say for a table lamp it should be 5A or less, and the earth lead inside the plug cut very short meaning that this would be the first to be pulled free if accidentally pulled. This would leave the equipment still working but without earth protection.

The regulation that now states that plugs must be fitted when the appliance is supplied must have saved many lives and prevented many fires. Peter also mentions electrical fires a situation that has had added meaning to me recently as two of my friends have both experienced these. Gas explosions may be instantaneously more spectacular but electrical fires can be just as devastating, if not more so, and there are very many more of these. Perhaps therefore the regulations regarding the electrical supply should be accepted just as those are for the gas supply.

Harold Hall, Hertfordshire.

The Model Engineer Photography Competition

Following our series on digital photography of models, as part of the centenary Model Engineer Exhibition we will be holding a digital photography competition.

Readers are asked to submit photographs of model engineering subjects which illustrate any aspect of the hobby. This could include full-size subjects of the type that appear in this magazine.

We receive many excellent photographs for the magazine and it is hoped that the competition will encourage more model engineers to submit their masterpieces.

Photographs can be of any model engineering or related subject you consider suitable and a selection will be published in the magazine after the exhibition. A selection of suitable photographs is included here, but please do not be limited by this selection.

A short list of photographs will be selected for final judging and display at the show.

The judging will be carried out by the Editorial staff and we will be looking for photographs that capture any aspect of model engineering and which will help inspire others to become involved in the hobby. Needless to say, good technical quality of the photographs will be essential. The winning photograph will be featured on

the magazine cover if suitable and for that purpose; portrait format pictures are best but not essential.

Submitting photos

Entries can be submitted as digital images on CD-Rom, via e-mail (JPG files please) or prints (maximum A4 size).

All entries must be clearly identified with the full contact details of the entrant.

If submitting digital files, please include a separate Word or text document on the disc containing those details. Prints should have a label on the reverse.

Each photograph should be accompanied by details of the camera (and accessories) used and details of the subject, location, and date of the photograph.

Entries with file sizes less than 2Mb each can be submitted by e-mail to: **MEphoto.comp@magicalia.com** with 'M.E. Photography Competition' in the subject line.

(in printed or electronic form) deemed suitable.

Photographs can be of any relevant subject but the judges reserve the right to exclude entries deemed unsuitable.



This address must not be used for any other purpose.

Postal entries must be sent to:

The Editor,
Model Engineer
Berwick House
8-10 Knoll Rise
Orpington
Kent
BR6 0EL

The envelope must be clearly marked 'M.E. Photo Competition'.

Please do not include any other material with your entry.

Competition rules

A maximum of two photographs per entrant will be accepted and will not be returned.

Entries not submitted in the correct manner will be excluded.

Copyright must reside with and will remain with the photographer although Magicalia Publishing Ltd. reserves the right to publish any entries

Photographs which include children must be accompanied by a signed release form from the parent(s) or guardian(s) giving permission to use and publish the photograph.

All photographs must have been taken by the entrant.

Photographs must not have been previously published.

Final judging will take place at the exhibition and the judge's decision will be final.

No correspondence will be entered into regarding the competition.

The closing date for entries is 15 August 2007

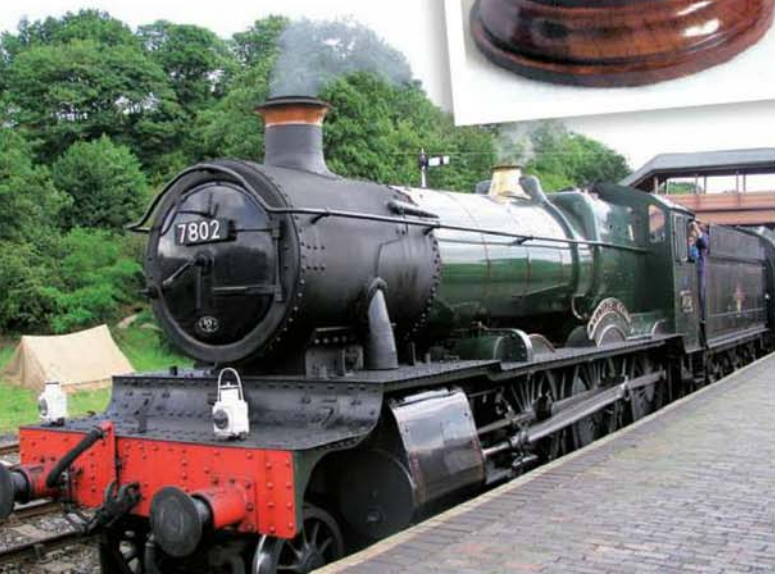
Cash prizes will be awarded for what the editors consider are the top three entries.

1st prize - £100

2nd prize - £50

3rd prize - £25

So get those entries in as quickly as possible so that we have something to judge. **ME**





PART 2

Continued from page 20
(M.E. 4303, 6 July 2007)

Neil Read
takes a tour of the
club stands.

1. Simon Hudson's 7 $\frac{1}{4}$ in. gauge
Stirling single.

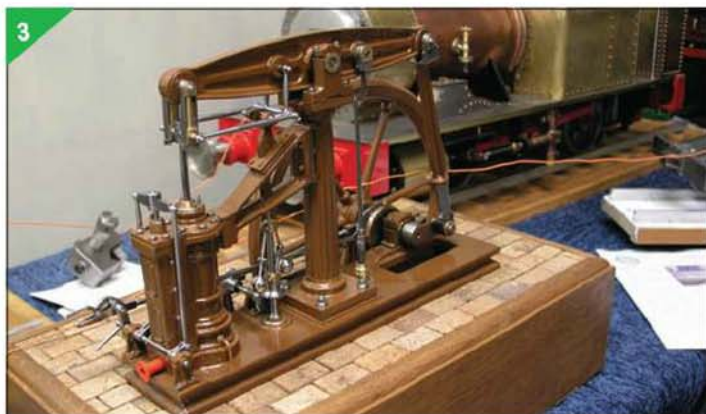
2. John Heeley's 1:4 scale
De Havilland Goblin 35 centrifugal-flow
turbo jet engine.

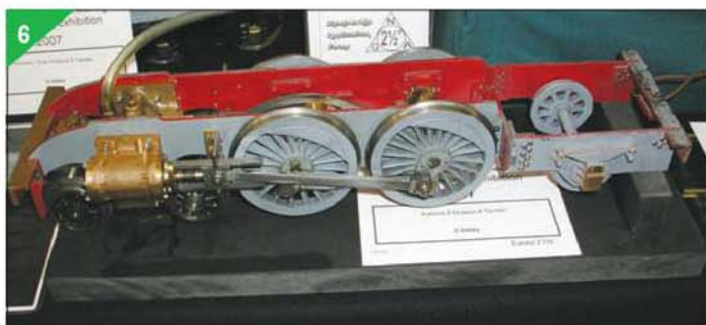
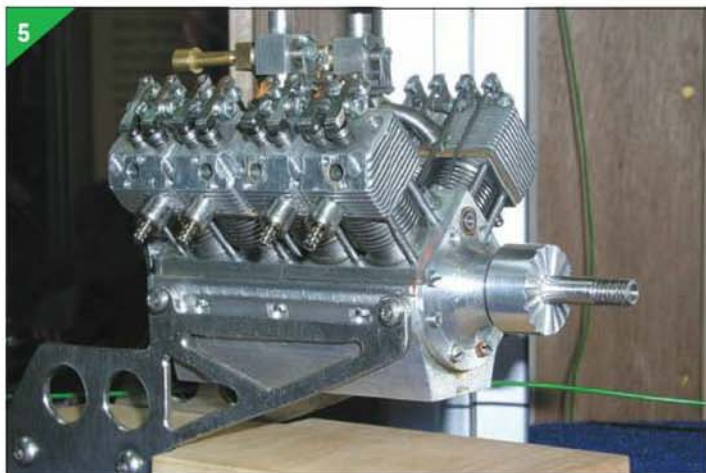
3. A Sanderson beam engine by
Geoff Shackleton.

4. Quick change tooling and a
height setting gauge by M. Gray.

As mentioned last time, this year's Harrogate show was particularly well supported by a substantial number of clubs. All had a fine range of models to view so the following pages can only give a glimpse as to what was on display. I hope you approve of the selection - they represent some of my favourites and I hope they cover a sufficient range to suit the tastes of most readers.

Photograph 1 was taken on the 7 $\frac{1}{4}$ in. Gauge Society stand and shows the GNR Stirling Single No. 1 belonging to Simon Hudson. This model was built by Nigel Etheridge over the course of 12 years and was bought by Simon's wife as a present for his 30th birthday - a





5. The V8 4-stroke aero engine built by K. Stephenson.

6. An Ayesha II being built to the design currently running in M.E. by Des Adeley.

7. A 1:8 scale Medlaeval clock of 1386 by B. Arridge.

8. Running for much of the exhibition was this neat Atkinson gas engine by D. Forster.

9. The 'Skeleton Crew' in action on the boating lake drew many smiles from the visitors.

10. R. Frank's nicely finished 1:3 scale Burrell single crank compound road locomotive.

11. A smart 'Ukamobile', alas I could not find the owner's name in the exhibition catalogue.



NATIONAL MODEL ENGINEERING AND MODELLING EXHIBITION 2007 TROPHY/SHIELD WINNERS

		Barry Jordan Trophy for Best in Show		
62/11		1:10 RNLI Lifeboat	A. Barlow	
		Precision Paints Award for Best Finished Model		
62/11		1:10 RNLI Lifeboat	A. Barlow	
		Raymond McMahon Trophy for Best Road Vehicle in Steam		
57/11		1:3 scale Burrell single-cylinder traction engine	A. Williamson	
		Myford Shield for Best Locomotive		
52/1		5in. gauge 'Jenny Lind' locomotive and tender	D. Roberts	
		Eventex UK Shield for Best Boat		
62/11		1:10 RNLI Lifeboat	A. Barlow	
		Trevor Shaw Award for Best Sailing Boat		
62/9		³ / ₈ in. Armed 'Dominica' Schooner 1812	I. Stewart	
		N.A.M.E. Shield for Best Club Stand		
5/0		Bradford Model Engineering Society		
		Warco Trophy for Best Stationary Engine		
58/13		Side lever paddle engine	J. L. Dobbing	
		Doug. Hewson Trophy for Best Rolling Stock		
49/1		5in. gauge Deutsche Reichsbahn passenger car	M. Voigt	
		Locomotives up to O-gauge		
Highly Commended	50/1	4mm Class 47 locomotive	J. Scott	
		Locomotives - 1in. to 3¹/₂in. gauge		
2nd Certificate	51/1	3 ¹ / ₂ in. gauge Shay logging locomotive	E. Addington	
		Locomotives - 5in to 7 ¹/₄ in. gauge		
2nd Certificate	49/1	5in. gauge BCI Deutsche Reichsbahn passenger car	M. Voigt	
2nd Certificate	53/1	5in. gauge E44 Electric Locomotive	M. Voigt	
2nd Certificate	52/2	Black Five	D. Wainwright	
2nd Certificate	52/1	5in. gauge 'Jenny Lind' Locomotive and tender	D. Roberts	
Commended	52/4	5in. gauge Pansy	P. J. Carr	
		Workshop Equipment		
Commended	55/1	3-off machine vices	P. Bowler	
		Road Vehicles		
1st Certificate	56/3	1:2 scale Burrell traction engine SCC	J. Morris	
		Stationary Engines		
1st Certificate	58/13	Side Lever Paddle Engine	J. L. Dobbing	
1st Certificate	58/3	40cc 4-stroke I/C engine	T. Pasco	
1st Certificate	58/4	1:4 Bristol Hydra aero engine	B. Perkins	
3rd Certificate	58/5	Stuart Turner triple expansion engine	I. Ritchie	
3rd Certificate	58/10	Triple expansion engine	G. Aisthorpe	
3rd Certificate	58/11	Triple expansion engine	G. Aisthorpe	
Highly Commended	58/8	Stuart No. 4	R. Greenwell	
		Miscellaneous		
First Certificate	59/4	1:76 Ruston-Bucyrus Dragline	R. Turner	
First Certificate	59/1	1:3 Sopwith Pup	C. Morgan/S. Wessel	
First Certificate	59/5	Corn finishing mill	H. Reid	
2nd Certificate	59/3	1:8 Type 35 Bugatti display	S. Atkinson	
Commended	59/7	1:12 Collectors doll's house	Mrs. M. Varley	
Commended	59/8	The Lyle wooden wall clock	N. Pratt	
		Model Boats - Kit Built		
Highly Commended	61/2	1:40 German WW2 Type 21 U-Boat	C. Behan	
		Model Boats - Scratch Built		
1st Certificate	62/11	1:10 RNLI Lifeboat	A. Barlow	
3rd Certificate	62/15	Bismark	M. Doogan	
Commended	62/3	³ / ₈ in. Steam Trawler 'Northern Spray' GY190	H. Hartley	
Highly Commended	62/2	¹ / ₂ in. Steam Trawler 'Athelstan' GY648	H. Hartley	
Highly Commended	62/9	³ / ₈ in. Armed 'Dominica' Schooner 1812	I. Stewart	
		Model Wheelwrights		
1st Certificate	63/1	1:8 Carriages in the Mews	J. Cartledge	
2nd Certificate	63/4	1:12 LNER Slop Cart	B. Young	
2nd Certificate	63/6	1:8 Canadian Stonelifter	B. Simpson	
3rd Certificate	63/5	1:12 Marks & Spencer Penny Bazaar	B. Young	
3rd Certificate	63/2	1:8 Brush Wagon	J. Cartledge	
		Rolling Stock		
2nd Certificate	49/3	5in. gauge 7 plank 10 ton Coal Wagon	D. J. Capel	
2nd Certificate	49/2	5in. gauge 2 plank 10 ton Stone Wagon	D. J. Capel	
2nd Certificate	49/4	5in. gauge 5 plank 10 ton Coal Wagon	D. J. Capel	

generous and thoughtful present as Simon has admired the Stirling Single design since he was a youngster.

Photograph 2 shows 1:4 scale De Havilland Goblin 35 centrifugal-flow turbo jet engine built by John Heeley of the West Yorkshire Model Aircraft Club. It was interesting to dwell on the advances in technology that have evolved in the 130 years since the full size Stirling Single locomotive was built.

To emphasise this point further, **photo 3** shows the Sanderson beam engine of Geoff Shackleton of Leeds SMEE - a design to the fore in the mid-19th century. Geoff reported that his model took 325 hours to build - that makes him a quick worker in my estimation.

There was a good range of tooling on display on most stands and **photo 4** shows the quick change tool post and height setting gauge devised by M. Gray of Bradford MES. Also on the Bradford stand was the neat V8 4-stroke aero engine built by K. Stephenson (**photo 5**).

Photograph 6 shows Des. Adeley's Ayesha II chassis coming along nicely and running on air on the National 2¹/₂" Gauge Association stand. The Hull and District SMEE stand was home to this rather fine Mediaeval clock by B. Arridge (**photo 7**).

Running at intervals throughout the show on the Cleveland Association of Model Engineers stand was this Atkinson gas engine by D. Forster (**photo 8**).

Photograph 9 shows a bit of fun on the boating lake entitled 'Skeleton Crew'. Alas, I did not get the name of the builder but the model was obviously cleverly made and the action of the rower was realistic - if that is the correct description for a skeleton rowing!

Photographs 10 and 11 show a couple of the vehicles in steam on the roads outside the main exhibition halls. Fortunately the weather held for most of the periods the event was open, the rain falling during the night.

Photograph 12 was taken ➡



12. A 6-stroke freelance gas engine by D. Bramwell.

13. The Brush Wagon by J. Cartledge won a 3rd Certificate.

14. W. Baker's Hand Organ on the Scunthorpe SME stand.

15. J. Mathews' well finished Shand Mason fire engine.

16. A smart LNER L1 2-6-4T by P. Raybold.

17. An early model by Cherry Hill - a Stuart Turner No. 9.

18. The handy 'nibbling device' made by SMEE member Tony Phillips.

Looking very bright and colourful in its red livery was J. Mathews' Shand Mason fire engine amongst the display organised by Grimsby and Cleethorpes MES (**photo 15**).

It was time to look at another locomotive and what could be better than the LNER L1 2-6-4T displayed by P. Raybold of South Durham SME (**photo 16**).

The last two photos were taken on the SMEE stand. **Photograph 17** is an early model made by Cherry Hill and is a Stuart Turner No. 9 horizontal engine. **Photograph 18** is of a 'nibbling device' made by SMEE member Tony Phillips. It is used for cutting out gaskets and shims. The material is clamped by the wing nuts and the shape required cut out by the circular punch mounted in the U-shaped member. This is actuated by mounting it in the drilling machine and operating the quill feed.

ME

on the City of Sunderland MES stand and shows a 6-stroke freelance gas engine built by D. Bramwell.

By way of contrast what about **photo 13**, which shows J. Cartledge of the Guild of Model Wheelwrights' 1:8 scale Brush Wagon or W. Baker's (Scunthorpe SME) hand organ (**photo 14**)?





RACHEL

A wall steam engine

PART 2

Continued from page 743
(M.E. 4302, 22 June 2007)

Stan Bray
continues work
on this handsome
steam powered wall
engine.

8. The distance bars were made from stock material and required little work other than than drilling the holes and forming the radii on the ends. The larger ones were done using a slitting saw and working in a series of overlapping cuts.

9. Two iron castings support the main bearings. The bases need machining and splitting to accept the bearings.

The top surface to base radius on the distance bars is too large to be made with the sort of end mill found in most home workshops. A boring head will do the trick but it will not deal with the slightly increased radius at the end and this will then have to be filed to shape.

It was finally decided to use a slitting saw of suitable radius, although obviously if a side and face cutter is available that can be adapted for use on a vertical milling machine it could be used in the same way but make the job a lot quicker. The actual radius is not critical but needs to look right.

Use the slitting saw to firstly mark the position on the top where the frame terminates and then line the cutting edge of the saw up with a theoretical line along the top of the cast iron boss. The saw is run along this line until the cutting edge is in line with the one showing the position of the frame. It is then taken back, lowered and another identical cut made. The operation is continued until the entire piece is removed. Unfortunately no matter how careful one is the chances of

getting every cut identical is around zero. So after the last cut has been made return to the top of the bar and make another cut the same as the original one but extend it by a minute fraction and then start the cutter rotating and slowly lower it until it is below the level of the bottom. The end result will be a reasonably smooth radius, although it will still need a little dressing with a file to complete the job.

We again come to the question of holes for bolting everything together and almost certainly the easiest way will be to drill the required holes in the base plates from underneath as it is then easier to mark them out. Hold the base plates in position on the distance bars and centre punch through to mark off the positions to be drilled. Most constructors will need to make a special punch that will fit exactly in the holes in the frame. This means putting a step in rather than the more usual plain angle.

The holes can be completed through the distance bar, which can then be secured to the cast iron section with double-sided adhesive tape or clamps and passing the drill through that

also. Either now or at some stage later the holes in the cast iron base plates will have to be counter bored to allow the head of the bolts to be recessed.

We are now in the position of having the distance bars complete, apart from the holes used to bolt up the bearing supports. As these go into the middle of the supports it will be necessary to drill both distance bars and cast iron section and then, at the appropriate time, transfer them to the bearings supports.

Main bearing support brackets (item 3)

Two iron castings are supplied for the main bearing brackets and, while the handsome appearance of these is admirable, it does create a few minor problems of its own. For example, it was difficult to establish a datum from which to work. It was finally decided to make use of the short flat surface at the top, although some readers no doubt will have other ideas.

A start was made by removing any unwanted material and mounting both pieces in the milling vice in such a way that the tops were level. To do this



10. The bases of the main bearing support castings were machined in the milling machine vice, the sides being supported with angle plates to take the jaw thrust.
11. Tidying up the edges of the main bearing support castings.

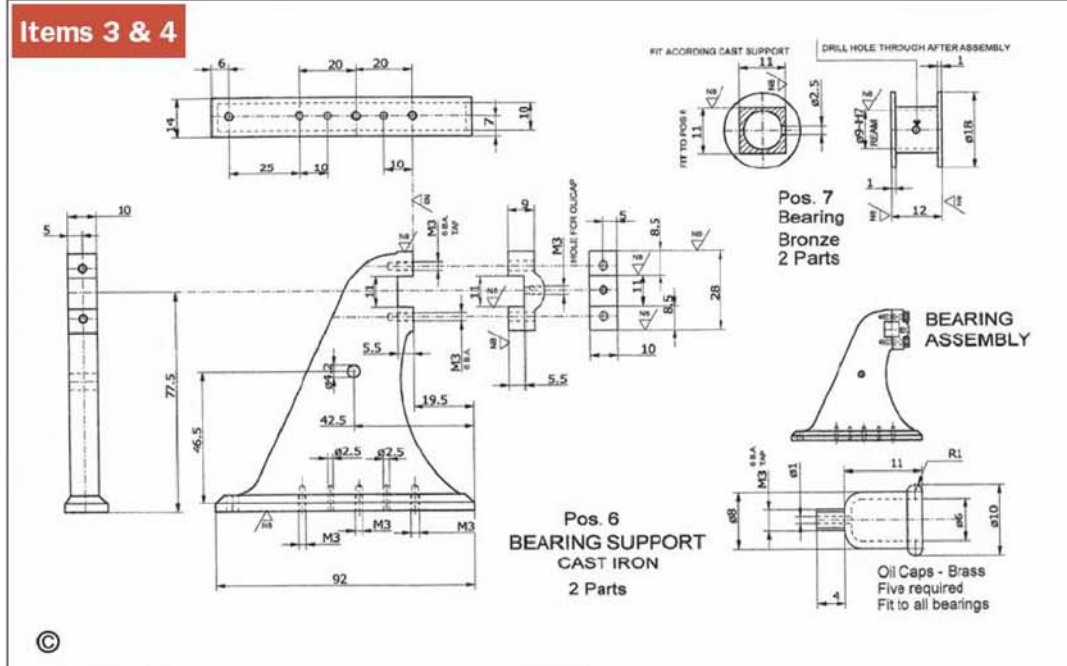
it was necessary to set blocks between the two uprights and two more on the outside, which gave the right effect to ensure the parts would remain firm when the vice was tightened.

Before tightening, check that the base of each casting is resting on the vice. When entirely satisfied with the set up take a cut across the top of each casting so that the tops are level with each other.

We now have a datum of sorts with which to work, although of necessity it is not going to be as good as one would like. However, put one casting in the vice so that it rests on the flat section, place a block either side of the casting and tighten the vice. Ideally the blocks that are used should be big enough to support right up the length of the casting, however it is unlikely that all readers who are building the engine will have blocks of a suitable size and it will be a case of doing the best one can. When entirely satisfied that the casting is standing correctly on the machined section and is absolutely secure, run a cutter across it to a depth that just removes all the casting marks.

Repeat the operation with the other casting making certain that the final run with the cutter is to exactly the same setting as that used for the first one. Both castings should now have flat machined bases that show no casting marks at all. If for any reason the second operation results in marks remaining it will be necessary to take the cutter down lower and then to machine the original piece again to the new setting.

The two machining operations have given us really good datums to work with as well as providing nice flat bases



for bolting down purposes. However, it will be necessary to return each to the machine separately and, standing them on the new datums, take a skim across the tops to ensure that both are of identical height.

Most of the rest of the work on the supports at this stage will be general fettling with a file. It may be necessary to just machine along the edge to smarten things up a little and ensure that the castings both have the same overall appearance. Most people will find it possible to hold the work in the machine vice for this operation. If it is not possible then it will be necessary to bolt them to the table, after giving support on parallels.

The bearings fit into square holes in the castings. These holes being in two pieces to allow the bearings to be fitted

and so it is necessary to fit studs and nuts to secure the bearings, which will be the next task. Start by machining two flats on each to provide suitable faces on which to drill. To do this it is necessary to set the casting in the machine vice in such a way that the machining will be at ninety degrees to the datum and this can be achieved by holding the casting in the machine vice, with the datum set vertical against a square placed on the table, or if necessary, on a parallel to raise it to the required height.

Although this can be easily done with a drilling machine it is a job where the mill/drill really comes into its own as the milling table can be used to support the square during setting up operations. It also has the advantage that the drill can be positioned for the

second hole by moving the table axis, which in turn means that by using the same settings when drilling the second casting both spacings will be identical. This does not mean that the job cannot be done with a drilling machine but purely that it is more convenient if a mill/drill is used.

Bearing recesses

Some builders may find the fitting of the bearing a little unusual; many stationary engine models have a simple bearing set in a round hole, although the bearing might be split. The bearings for Rachel are a copy of full size practice and so are set in square housings rather than round ones and we will shortly deal with how to go about making them. However, it should be pointed out that as far as





12. Re-machining the tops of the bearing supports with the work clamped in the milling machine vice.

13. Setting up to drill the main bearing stud holes and for separating the main bearing caps.

14. Separating the bearing caps with a slitting saw.

15. A fabricated pair of main bearings. The round ends are silver-soldered to the square centre portion.

section piece in the chuck and turn it round, then machine its end to the same length and diameter as before, so that it will accept a washer. Heat the two joined pieces to separate them and clean off all traces of soft solder. Repeat the operation on the bearing end washers, ensuring all traces of solder are removed. It is now possible to join the ends of the bearings with the washers using silver solder and, after a clean up, they can be assembled as pairs and fitted into the recesses in the castings.

Put the bearings in the supports and fit the crankshaft (or a piece of bar the same size) through. Support the assembly on a surface plate and check the height of the crankshaft from the plate on each side of the supports. If there is any difference remove sufficient metal from the bottom of the support on the higher side, to get the shaft exactly level.

Passing the holes for the bolts that hold the supports in position requires some juggling although the final solution was simplicity itself. The bearing supports were stuck to the distance pieces, using a slow setting cyanoacrylic adhesive that gave plenty of time to make any necessary adjustments. A length of mild steel rod of the same diameter as the crankshaft was pushed through the bearings and distance pieces and a set square used to ensure they were in the right place. After allowing the adhesive to set, the supports with the distance pieces attached to them were taken to the drilling machine and a drill passed through, a stop having been set to ensure that all holes went to the same depth.

● To be continued.

novices are concerned building can be considerably simplified if the square housing is not made and a round one is used instead. There will be absolutely no difference in appearance if they are fitted in this way.

Round bearings

As far as these bearings are concerned it will be a simple matter of splitting the bearing support castings in the appropriate place, rejoining the parts with bolts and then drilling a suitable sized hole on the joint line. The actual bearings should be made of bronze rod and a piece of the right diameter and just over twice the length required for the two bearings is reduced to exactly half of its diameter. This can either be done with a milling cutter, or the more prudent amongst us can use a slitting saw and will no doubt save the redundant piece of bar for some other purpose at another time.

Don't forget if using a saw that the cut must be made to leave an exact half diameter piece, running the saw along a

centre line will simply result in two undersized pieces. Once the required semi-circular section piece has been made, it can be cut into two and these two parts carefully soft soldered together to make one round piece that can be machined to the required shape.

True type bearings (item 4)

To make correctly shaped bearings as shown on the drawings, a start can be made by slitting the bearing support castings after having first drilled a hole exactly on the centre of the cutting line. The split goes right through the centre of that hole and when the parts are put together again we will have an elongated oval. That oval now has to be converted into a square and to do so requires nothing more than some very careful work with an end mill or even a file if no milling facilities are available.

The bearings should be made from bronze and there are several ways of going about it. One way will be to make them in the same fashion as

described for the round ones, by reducing a piece of bronze rod to half its diameter, soft soldering two pieces together and then, starting where one left off, by finding the true centre and drilling the appropriate sized hole to fit the crankshaft. The next task is to mill or file the square section to fit the recesses in the casting, finally heating the piece so it will fall in two.

A third solution is to solder together two strips of bronze and, with any luck, it should be possible to obtain the exact size so it will be possible to limit the amount of machining. However, remember it will be necessary to leave a chucking piece so the pieces must be over length. These can be drilled in the 4-jaw chuck and the end that protrudes machined round to the same diameter as the across flats size of the piece. Split and join a short length of appropriate brass or bronze and use the finished material to make four washers of the appropriate diameter and bore for the circular ends of the bearings. Part off the square

PART 9

Continued from page 752
(M.E. 4302, 22 June 2007)

Bill Steer

in his penultimate episode continues with the construction of the universal support structure.

A compact RATCHET BRACE

The support bar is shown in **fig 26** and the reaction bar in **fig 27**. Both are made from lengths of $\frac{3}{4}$ in. square bright mild steel. Cut two pieces of this material, one, a shade over $8\frac{3}{4}$ in. long the other just over $7\frac{1}{4}$ in. long. Mill, shape, turn, or simply file the ends square, finishing the bars to the specified lengths. Chamfer the appropriate edges. **Photograph 60** shows one end of the reaction bar being finished with the aid of a small hand-shaping machine.

Taking the longer of the two bars (the support bar) mark out the positions of the 13 holes,

starting with the one in the middle and working outwards. These holes should be $\frac{17}{64}$ in. diameter (tapping size for an M8 x 1.25mm thread) and are best located and drilled using co-ordinate methods. I am aware that marking out is not strictly necessary if this method is used but I like the reassurance that the pre-indicated positions can give. If you don't have the means to co-ordinate drill, then just centre punch the locations and use a conventional drilling machine. To ensure that the correct size tapping hole was produced, I first went through with a $\frac{1}{4}$ in. dia. drill and then followed this

with the $\frac{17}{64}$ in. drill.

Once all the holes have been drilled in this part, it can be clamped to the shorter reaction bar and used as a drilling jig to locate the corresponding holes in this item. These should all be drilled $\frac{17}{64}$ in. dia. initially, then opened up and reamed $\frac{11}{32}$ in. This size hole provides generous clearance for the M8 studding and allows for a small degree of misalignment that can help when faced with particularly difficult supporting problems.

Returning now to the support bar, working from the upper surface (that without the chamfered edge) open up all

Fig 26. Support bar.

Fig 27. Reaction bar.

60. Using a hand-shaping machine to finish the ends of the reaction bar.

61. Detail of the finished support and reaction bars.



Fig 26

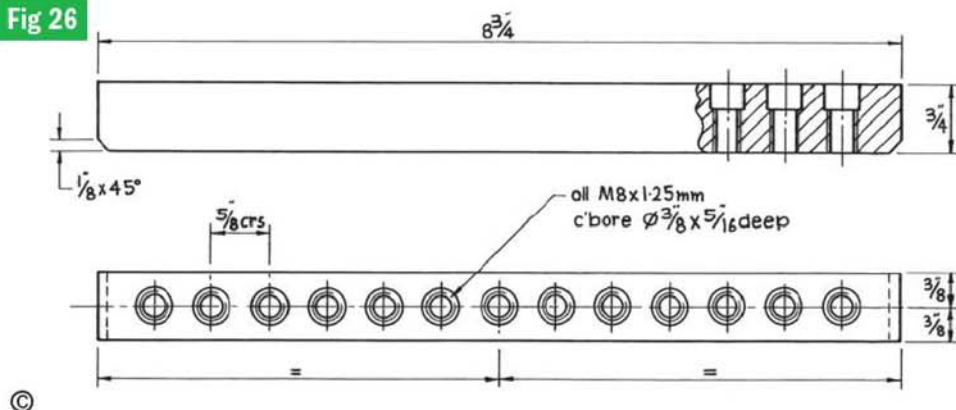
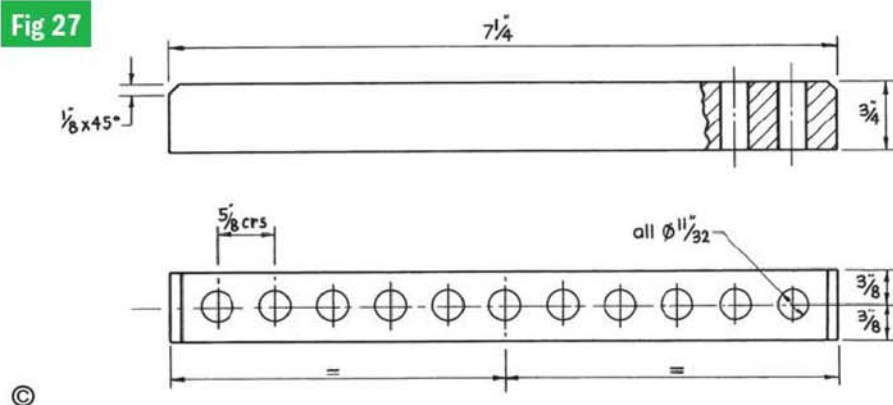


Fig 27





the holes with a $\frac{3}{8}$ in. dia. drill, for a depth of $\frac{5}{16}$ inch. This is to provide adequate clearance for any drill bit that may break through a workpiece when the support bar is in use. Finally, tap the remaining portion of the holes M8 x 1.25 millimetres. To help ensure that the tap is held upright, clamp the support and reaction bars together and use the latter as a guide.

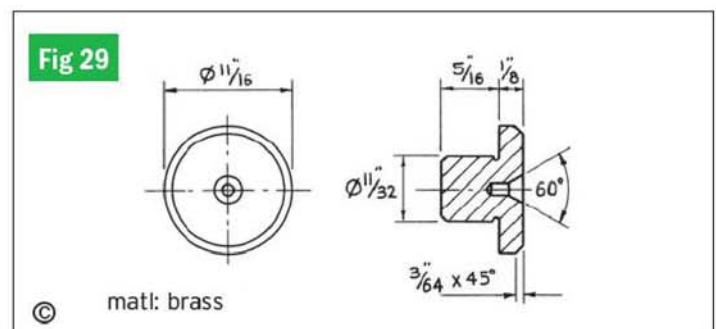
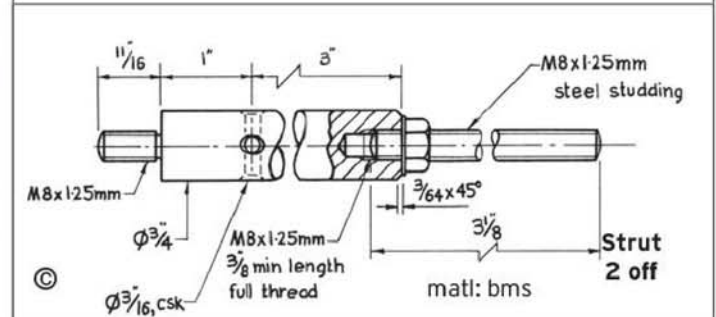
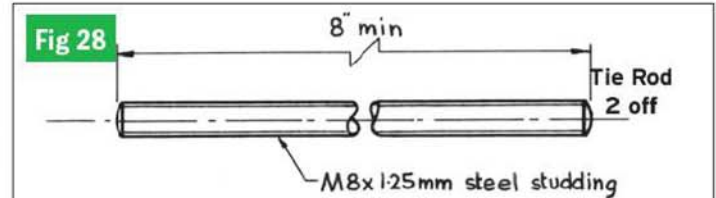
De-burr all the holes and clean up the upper and lower surfaces of the support and reaction bars by draw-filing. All other surfaces should be generally tidied up and after degreasing given a coat of primer followed by a suitable paint finish. **Photograph 61** shows detail of the completed support and reaction bars.

Tie rods and strut

Drawings for the tie rods and strut are given in **fig 28**. As mentioned previously, the tie rods are made from M8 commercial studding. Two lengths, cut 8in. long and a further two at 10in. will probably serve most applications although it is worth having a

few longer pieces around just in case! For the sake of neatness and to ease assembly, the tie rods should have their ends slightly rounded.

The strut can be made from a length of $\frac{3}{4}$ in. dia. bright drawn mild steel, just over $4\frac{11}{16}$ in. long. With the work gripped in the 3-jaw chuck, face one end, centre and drill $\frac{17}{64}$ in. dia. for a depth of $\frac{3}{4}$ in. and then tap M8 x 1.25 millimetres. Those with smaller lathes, are advised to use a fixed steady for these, and the following operations, due to the rather long overhang of the work from the chuck (**photo 62**). Reverse the workpiece, turn down to $\frac{5}{16}$ in. dia. for a length of $\frac{11}{16}$ in. and tap M8 x 1.25 millimetre. Turn a small round-bottomed recess at the shoulder and face the end of the threaded portion making it slightly spherical. Finally, remove from the lathe and drill a pair of $\frac{3}{16}$ in. dia. holes, at right angles to each other, into the body of the strut for use with a tommy bar. These holes should be positioned 1in. beyond the shoulder, formed



by the threaded stub, and also slightly countersunk.

After the strut has been degreased, primed and painted, a piece of M8 x 1.25mm studding, $3\frac{1}{8}$ in. long, equipped with a nut and washer, is screwed into the threaded hole. **Photograph 63** is of the finished tie rods and strut.

Button

The button is shown in **fig 29** and is a straightforward turning job. Grip a short length of $\frac{3}{4}$ in. dia. brass rod in the 3-jaw chuck, with about $\frac{5}{8}$ in. protruding. Face and turn down to $\frac{11}{32}$ in. dia. for a length of $\frac{5}{16}$ inch. Lightly chamfer the edge of the resulting stub and make a small round-bottomed recess at the shoulder. Continue turning beyond the shoulder, to bring the diameter, in this region, to $\frac{11}{16}$ in. for a distance of about $\frac{3}{16}$ inch. Part off the workpiece so that it is just a little over $\frac{7}{16}$ in. long. Reverse in the chuck, face, chamfer and then using a $\frac{3}{16}$ in. dia. Slocumb drill put in the centring recess. The finished button can be seen in **photo 64**.

62. Using a fixed steady to support the strut whilst working on its end.

63. The completed tie rods and strut.

64. The button.

Fig 28. Tie rod and strut.

Fig 29. Button.

Clamps

Figure 30 gives details of the clamps. Although we only require two for the present application, they are so useful for attaching work to machine tool tables etc. (use a T-bolt, passing through the slot as an anchor), that if you haven't already got a collection of similar items, it may be worth considering making a few more whilst you are set up for this particular job.

The body of the clamp is made from a piece of bright mild steel, $\frac{3}{4}$ in. wide by $\frac{5}{16}$ in. thick and $2\frac{1}{4}$ in. long. Mark out the positions of the slot and holes. The smaller of the two holes should be drilled No. 16 and then reamed $\frac{3}{16}$ in. while

RATCHET BRACE



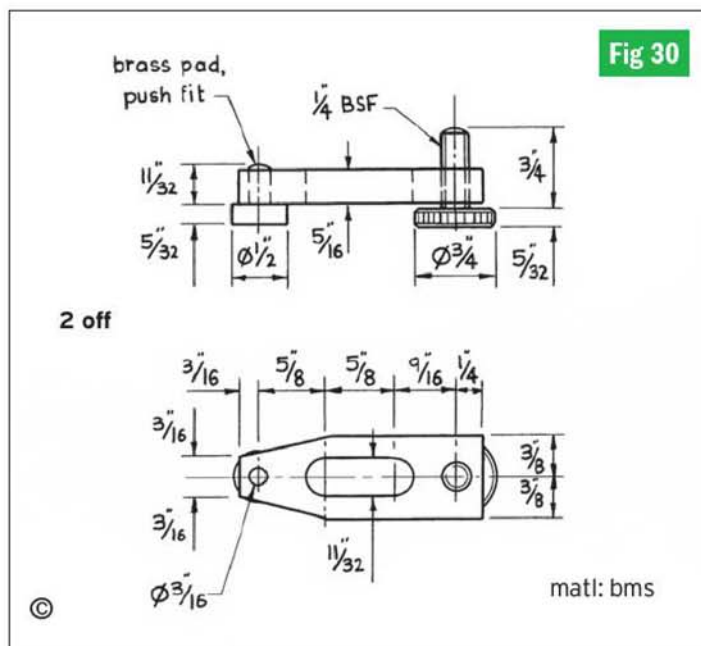
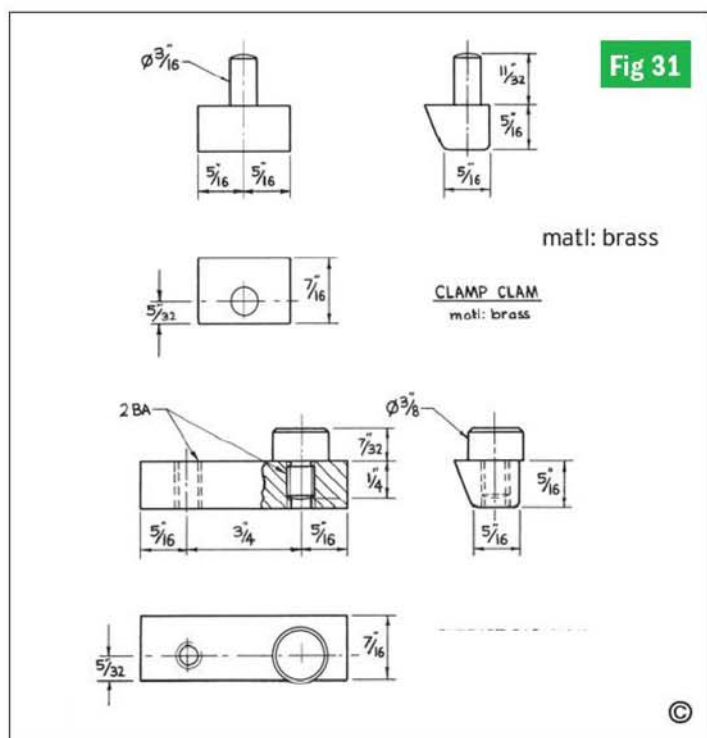
the larger is drilled No. 3 and tapped $\frac{1}{4}$ in. BSF. The slot can be made either by chain drilling and filing or alternatively it can be milled, preferably using an $\frac{11}{32}$ in. dia. slot drill. If the latter technique is used it will be worth using the same set-up, with co-ordinate methods, to locate and drill the holes. I made mine that way, with the workpiece gripped in a small machine vice bolted to the vertical slide of my lathe (**photo 65**). The tapering end section is easily produced either by sawing and filing or by milling. This component should be finished by draw-filing.

The pads are turned from a piece of $\frac{1}{2}$ in. dia. brass rod to the dimensions shown on the drawing. The smaller diameter section should be a push-fit in the corresponding hole in the clamp body. Although circular pads are probably the most useful for general purposes, for some applications other shapes



may be more appropriate. For example, when using the tool to drill holes in a length of rail, a better grip will be obtained with a clam shaped to fit the profile of the rail web. This should work against something similar fitted to the support bar. A drawing of a pair of such clams is given in **fig 31**; these can easily be made from odd scraps of brass.

To complete the clamps we need a pair of support screws. These can be turned from a length of $\frac{7}{8}$ in. dia. BMS rod. Grip a piece of this material in the 3-jaw chuck with just over 1in. protruding. Face the end and turn down to $\frac{1}{4}$ in. dia. for a length of $\frac{3}{4}$ inch. Using a tailstock die-holder thread this portion $\frac{1}{4}$ in. BSF. Make a small



round-bottomed recess at the shoulder. Turn down the head to $\frac{3}{4}$ in. dia. and part off so that this will end up a little over $\frac{5}{32}$ in. thick. In order that we can finish the head we now need to be able to hold the screwed portion without damaging the threads. The best way of going about this is to make a small, split, brass collet.

For this, take a length of $\frac{1}{2}$ in. dia. brass rod and grip it in the 3-jaw chuck with about 1in. protruding. Face the end and then turn down the outside to $\frac{3}{8}$ in. dia. over a length of $\frac{5}{8}$ inch. Part off to a length of $\frac{3}{4}$ in., reverse in the chuck, and with the shoulder hard against the jaws, face, centre, drill and ream $\frac{1}{4}$ in. dia. right through. With a small centre punch make an indentation in the face next to No. 1 jaw. At the same time, using a scribe, make a mark half way between No. 1 and No. 3 jaws. Remove the work from the lathe and make a radial saw cut leading into the hole from this marked position. Use a small triangular file to remove any burrs. Our support screw can now be held in this collet which should be returned to the chuck, lining up the punched mark with the No. 1 jaw. On switching on the lathe you should find that the workpiece runs quite true.

We can now face the head to its final thickness of $\frac{5}{32}$ in. To produce the straight knurled

finish, set up a small pointed tool, on its side, in the tool post, and at the same time arranging for a 60 tooth gear to be linked to the lathe mandrel for use as an index. The tool can now be brought up to the work and the saddle racked back and forth, as we did when making the ratchet wheel, gradually increasing the depth of cut. When this has reached 15thou. the next position can be indexed and the cycle repeated until we have returned to the starting position.

At this point, disengage the indexing gear and replaced the tool with something more conventional for turning, ensuring that its edge is very keen. Use this tool to skim a thou-or-two off the surface, and thus remove any burrs. The edges should also be chamfered at this stage. Finally, just to add to the appearance, heat the screws in a sand bath until they have taken on a uniform blue colour, quench in water, dry and then coat in oil. **Photograph 66** shows the completed clamps.

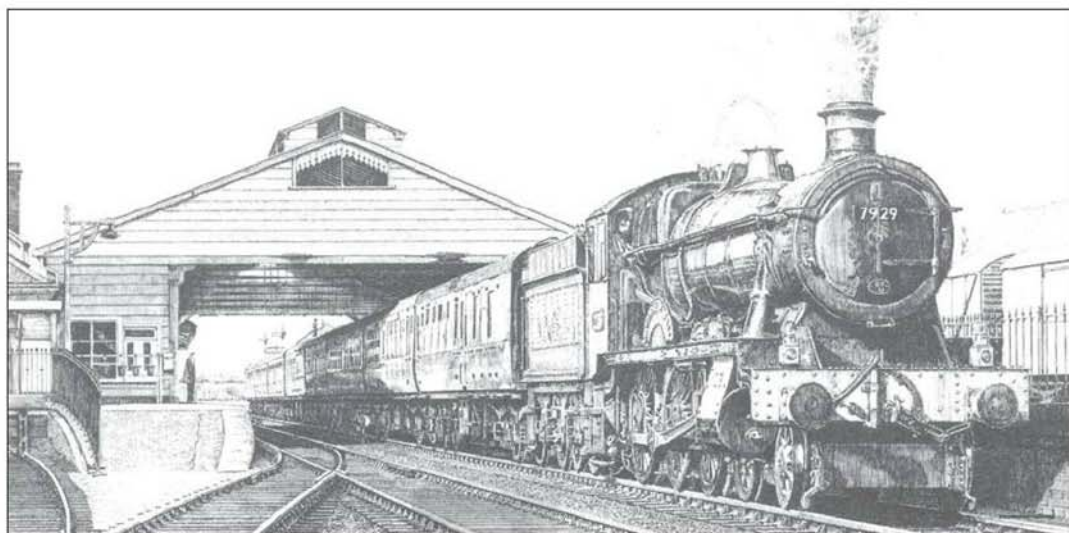
● To be continued.



PART 4

Continued from page 756
(M.E. 4302, 22 June 2007)

Neville Evans
describes the
smokebox assembly
for this Modified Hall
design.



WYKE HALL

The smokebox should properly be called the front end, including as it does the complete blast pipe and chimney assembly, snifter valves and blower. The smokebox tube measures 5.622in. dia., is 6.375in. long and either $\frac{1}{8}$ in. or 3mm thick, depending upon what is available. This odd size possibly happened because when they built 'William Dean', which was of course the first of the illustrious band of standard GWR 4-6-0s, they had a piece of 5ft. $3\frac{1}{2}$ in. tube hanging around in the scrap bin, and decided to use it, thinking that they could always change it to something that was commercially available at 5in. scale at a later date. And then forgot. However, as all the 4-6-0s with the No.1

boiler have the same smokebox diameter, Pete Thomas will be getting a small batch rolled up to the correct size, which should solve many problems. To do the job properly, the rivetted joint should be on top. Note that this is one of the many places where the Modified Hall differs from the Collett Hall, in that the chimney sits a little further forward, presumably because of the larger superheater header.

Instant gasket

The cut out in the bottom of the smokebox gives access to the important blast pipe sealing flange screws, which, like the steam pipe flange screws could with advantage be of the Allen pattern. Make certain of the seal between the side plates

and the side of the smokebox; I would use a proprietary silicone 'instant gasket'. Hermetite make a particularly strong and tenacious kind, known to the motor-bike fraternity as 'Orange Gorilla Snot' due to its bizarre colour. I would never use anything else. An alternative seal could be made with a curved plate sitting on the bottom of the smokebox tube.

The blast pipe, which of course is a $\frac{7}{8}$ in. dia. brass tube, pokes up through a hole in this plate, which could be merely stuck to the bottom of the smokebox with sealant.

The smokebox front is best made from brass, or even a gunmetal casting, if a suitable one be to hand. Observant readers will have recognised that the design differs from that >>

1. Modified Hall left-hand trailing coupled wheel.
2. Modified Hall right-hand handrail knob and ejector pipe clip.



of the 'Grange' in that I have thinned down the front flange to enable longish rivets to be used to fasten as well as to decorate the assembly. This is an example of evolution in design, and is so obvious a modification that I simply can't understand why I didn't do it like that in the first place. I have changed the master drawing of the 'Grange' to accommodate the new design as I consider it to be a great improvement on my previous efforts.

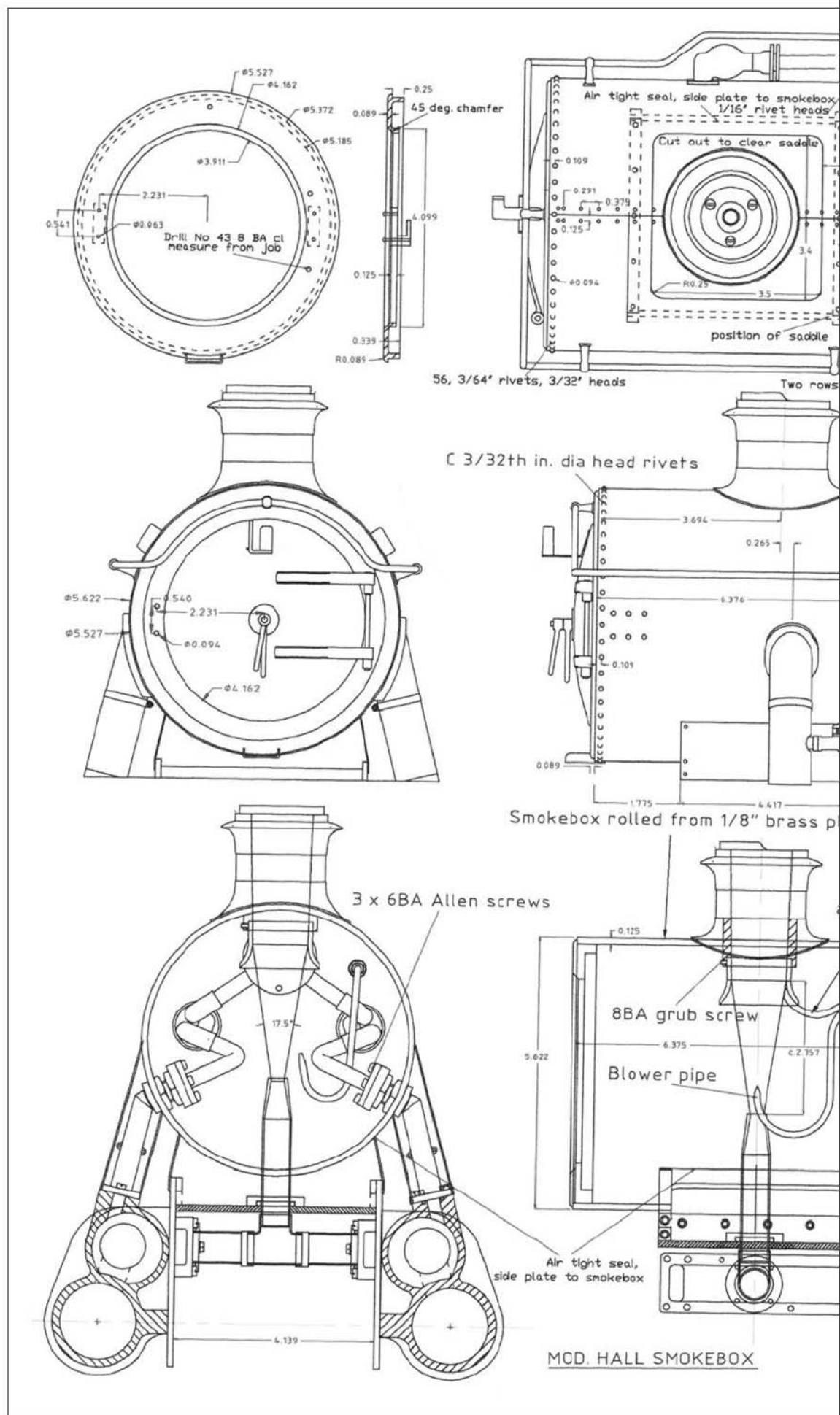
There is a large number of rivets, the front ones, 56 in number, have $\frac{3}{32}$ in. dia. heads, which means that a $\frac{3}{64}$ in. rivet may be suitable. The rear two rows are 42 each row (as near as I can count) and are probably best put in as dummies, the underside of all three rows being lightly countersunk. I do this by hand, using a short $\frac{1}{8}$ in. dia. drill, sharpened to a suitable taper and a small chuck. The bashing down is performed with the aid of a long, thickish punch with a tapered end.

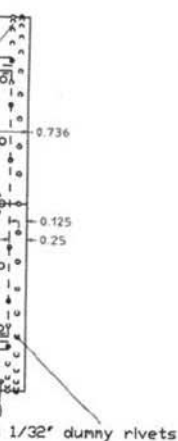
The two rearmost rows will have to be ground down to enable the boiler to slide in. I find that a flexible drive on a drill or purpose built motor drive, with one of those dinky little abrasive drums attached, is made for the job. A couple or three countersunk screws would act as belt and braces, but I wouldn't bother with them myself, due to the difficulty of either hiding the screwdriver slots or getting the darn things out when you want to remove the boiler.

The smokebox door is quite straightforward, I have not recommended a measurement for the dart length, as it will probably have to be modified with reference to the width of the locking bar. Use a simple depth gauge and ensure that the outermost dart nut has about a thread left sticking out when the door is tightened fully.

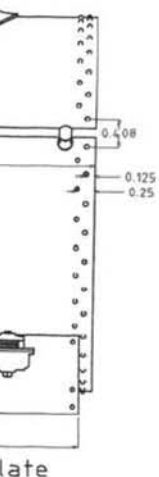
Blast pipe and draughting

The draughting arrangements for our Great Western two-cylinder locomotives have remained constant throughout



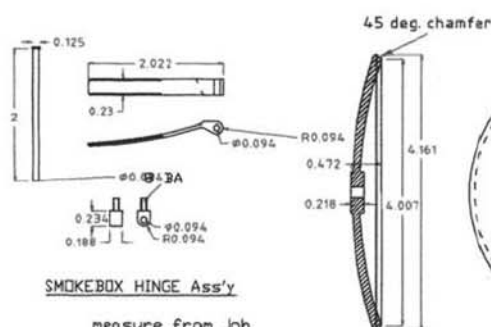
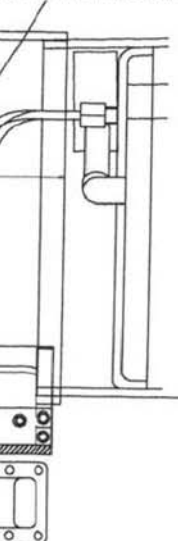


1/32" dummy rivets

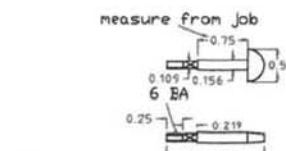


plate

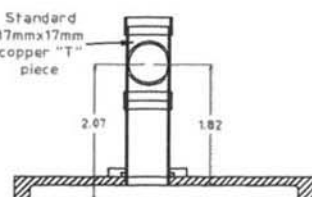
alternative blower pipe



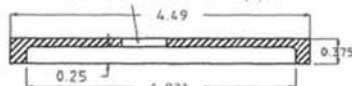
SMOKEBOX HINGE Ass'y



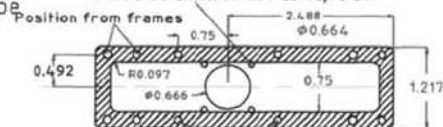
SMOKEBOX DART

4 x No 43 on 0.979 in. PCD
Sealing washer
2 off Brass

EXHAUST MANIFOLD 2 OFF

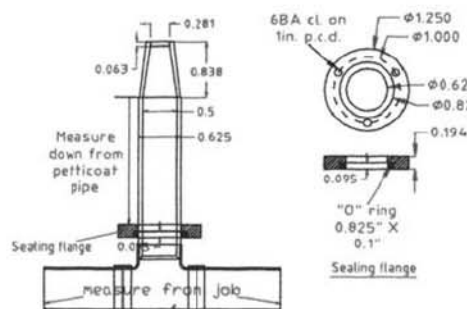
Measure horizontal position
of this hole from blastpipe

4 x No 50 on 0.979 in. PCD tap 8 BA

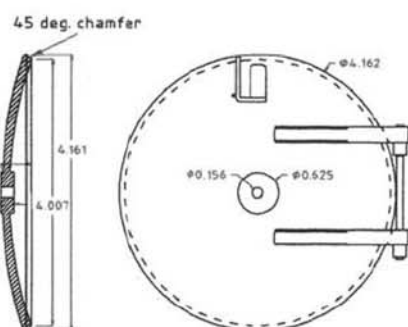


Drill 4 x No 34 6 BA cl.

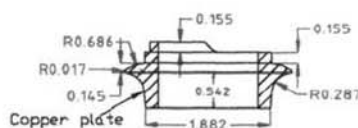
EXHAUST MANIFOLD BASE 2 OFF



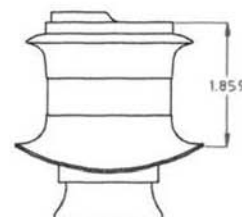
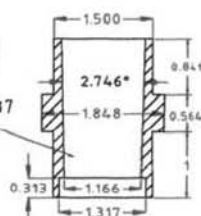
BLASTPIPE



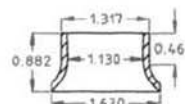
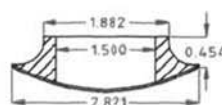
SMOKEBOX DOOR

Internal taper is
c.2.75 degrees
inclusive.
Set slide to c.1.37

Copper plate



CHIMNEY MODIFIED HALL

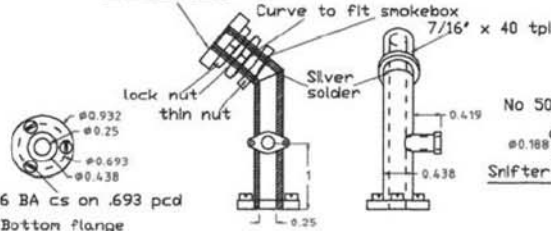


Top 7/16" x 40 tpi

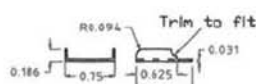


No 43 tap 6 BA on .693 pcd

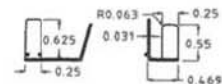
Bolting flange



MOD. HALL Steampipe 2 off Cu.



Front footstep



Front lamp bracket

Snifter valve 2 Off L.W. casting
Follow instructions on packet

No 50 tap 10 BA

Snifter flange detail

MODIFIED HALL No 7929 "WYKE HALL" SMOKEBOX & FRONT END

MODEL ENGINEER



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January to June 2007**

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3. GWR snifter valve.

4. The 'Schools' outside cylinder pattern.

5. and 6. The 'Schools' outside cylinder casting.

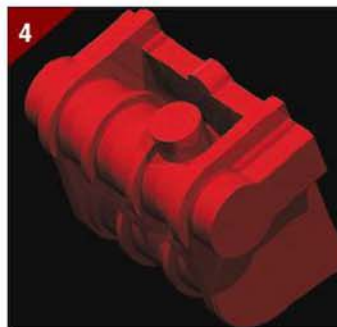
the range. Simon Bowdich sent me one of his usual learned screeds based on the work of Professor Bill Hall, which I have followed to the letter. I must emphasise however that as always, draughting calculations are largely empirical and fine tuning will no doubt become necessary when the locomotives are on the track.

The blower takes the form of a bent pipe that simply goes up the chimney. This is the sort that I would now prefer to use. In the past I have used the rather elaborate arrangement of a multi-jet blower, as specified by my illustrious predecessors, LBSC and Martin Evans. I well remember my 'Highland Lassie', which used two of them for the double blast-pipe. There was no end of a

hassle trying to connect them up within the confines of a 3½in. gauge smokebox. The greatest advantage of the bent pipe is that there is far less obstruction in the middle of the smoke-box, giving freer flow of combustion gases to mix with the blast.

The snags are that it is obviously more vulnerable to accidental damage and when used in conjunction with a screen type spark arrester, positioning may be more difficult because we must make a hole in the screen to poke the tube through. Mike Williams however, has repositioned the blower pipe on the 'Loch' to tuck it closely around the edge of the petticoat pipe, which makes for a much neater job, and doesn't seem to reduce its efficiency at all. The spark arrester problem has now gone away as the top of the screen can be notched slightly to allow the tube to enter the petticoat pipe.

The blower pipe itself is quite simple, provided that the business end is brought down



to a thin taper surrounding a 0.040in. hole. What I have done is to anneal the end of the tube and to slide a piece of 1mm stainless steel wire into it. The tube is then gently beaten around the wire against a flat metal surface, turning it continuously the while in the fingers. The tube takes on a lovely taper and when the correct shape has been achieved I simply pull the stainless steel wire out of the tube with a pair of pliers.

This system is used on my 'Princess' and performs faultlessly. I have a selection of cunningly bent spanners that I use on awkward bits like the union nut that holds the pipe on to its union and lies in the dark depths of the smokebox.

If anyone wishes to use the more complex arrangement, please refer to the 'Grange' drawings. Quite honestly however, the multi-jet version shows no advantage over the simpler system apart from its greater rigidity. I would therefore not recommend it.

The blast pipe arrangements are quite straightforward. The proportions and dimensions, as I mentioned earlier, are due to the late Prof. Bill Hall, and should be pretty close to

the finished tuned up article. I must point out that as usual, it is necessary to have a detachable bell mouth, so as to allow access to the steam pipe/ regulator assembly. Use a small(ish) grub screw to hold it on. The original Modified Hall used a standard short chimney. Later research however, showed that there was more power to be found with modification to the blast arrangements and so a tapered chimney of smaller diameter and no capuchon was arrived at. I have not yet been able to obtain a drawing of said chimney, but will publish one as soon as I do.

Stowe cylinders

Eagle-eyed readers will by now have noticed the three photos of the first 'Schools' class outside cylinder castings and patterns. These items have taken far longer than anticipated both in the pattern making and in the casting. Pete Thomas wants the two outside cylinders to be machined before he finishes the very complex inside patterns so as to avoid any time consuming hiccups, which seems to me to be a very good idea.

The two Modified Hall pics are of a left-hand trailing coupled wheel (obviously), and of a standard GWR right-hand handrail knob, complete with the rather ornate bracket that doubles as a support for the ejector pipe and handrail knob mounting. I hope that we'll see some lost wax patterns for these tricky items in the near future, so that we can get them just right.

● To be continued.



Continued from page 760
(M.E. 4302, 22 June 2007)

372. The best picture we have of the Savage wagon controls is on an 'A' type wagon, this one was made in 1904 and sold in 1906 to Marshall Hill, a West country showman. It has the reversing lever outside the cab. Two generating wagons were built, one with a locomotive and one with a water tube boiler. The generator had its own self-contained engine and Pickering governor. The chassis is sign written A. W. 8 Tons and Speed 5mph. The picture may have been taken at the Smithfield show in 1904 on the Savage sales stand.

SAVAGE'S

UNIVERSAL CARRIER

Two seats are provided, one each side of the cab. The driver sits on the right, his mate on the left. The mate's main job would have been making up and maintaining the fire, the fire hole door being central on the water tube and vertical boiler allowing firing either from the

The driver's seat has two levers to his right; the nearest one is the forward/reverse lever and the outside one the change speed lever. Our 'C' type has both these levers inside the cab but on earlier class 'A' and 'OA' wagons one lever was inside and one outside the cab side panel, see **photo 372**. Both levers had spring loaded latches to lock them in position, the forward/reverse lever having two forward and two reverse settings so the wagon may be 'notched back'



374. On the locomotive version the steering shaft leans back. (photo: Stan Nilper).

375. Close up of the feed pump and mechanical lubricator drive.

Fig 122. Arrangement of operating gear.

in either direction when running freely. I cannot think of any circumstances when the UC engine might be notched up in reverse as when manoeuvring in a yard it would be decidedly unhelpful to 'notch back' the reversing lever as the engine would not be as free

starting. Perhaps it was habit on Savage's behalf, as on a traction engine the crank might be run backwards regularly (relative to normal rotation for road use) when belted to a drum or other equipment.

On the driver's left is the feed water control cock. This lever works in a quadrant with a series of holes in it so the amount of boiler feed water being delivered may be set and locked with a pin or peg (no details available). Just ahead of the seat, running transversely, is the drain cock operating lever. A series of rods connect this lever to the two HP and two LP drains under the cylinder.



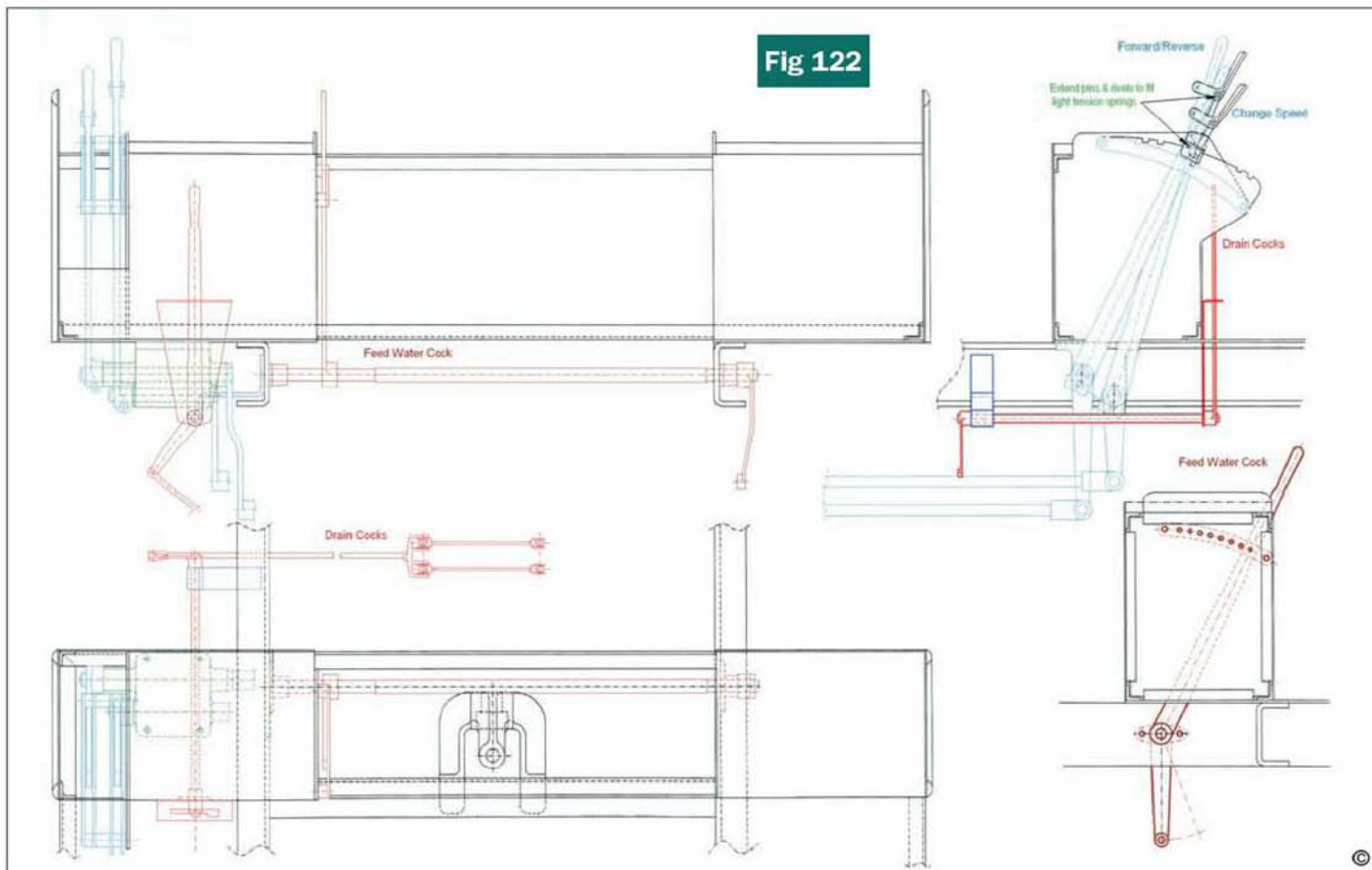
Usual questions

Glancing around at the drawings, of which there are many in this article, the various control levers and rods will clearly lead to the usual question as to whether to cut them from the solid or to fabricate them from individual pieces. The decision is best left to the builder, but fabrication might be more tempting as the silver-soldered joints are usually hidden below the driver's seat, and in any cases the builder may decide to paint them which will hide the fabrication marks.

A second question is the material to adopt. If the controls are to be left bright and stainless steel stock is available there is

much to be said for using it. I have never regretted carving all the bright work on my 1 $\frac{1}{2}$ in. to the foot Allchin from stainless. If shiny controls are sought mild steel may be used and either nickel or chrome plated; personally I find bright chrome a bit overpowering and out of place on a model. Bright mild steel is just fine on its own but will, in use, quite quickly lose its lustre. This, of course, might be just as the builder envisages and is naturally entirely prototypical.

When machining, the 5 to 6in. radii on the quadrants are likely to be on the big side to machine on a rotary table but could easily enough be marked out and filed





by hand. Other than that it is just a matter of sawing, filing, drilling and turning the round handles.

Pivot bracket

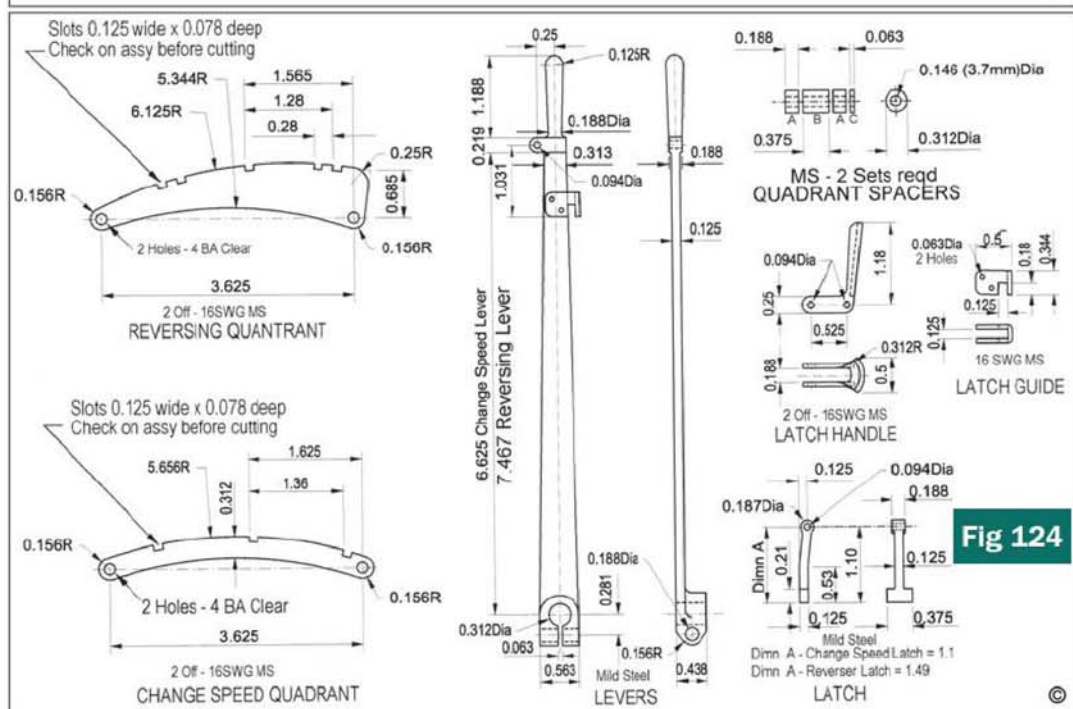
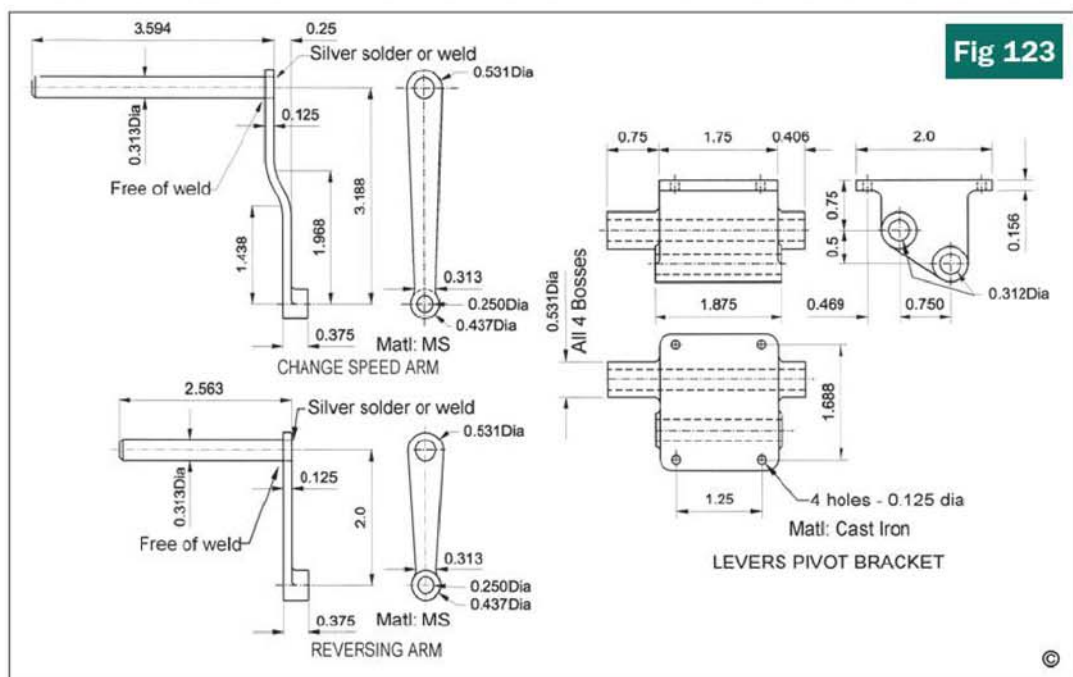
Most of the controls pivot on a bracket, which is fitted

underneath the driver's seat. This may be a casting but could just as easily be another fabrication, see **photos 376** and **377**. A shaped steel block with brass or bronze extensions, either pressed or

silver soldered into place, will do the job just fine. Four fixings hold it in place.

The feed water lever pivots on a separate cross shaft which spans the two chassis channels, drawn in maroon on

376. A fabricated pivot bracket (photo: John Thompson).
377. The pivot bracket bolts up beneath the driver's seat (photo: John Thompson).
378. Steering bracket for water tube and vertical boiler wagons (photo: John Thompson).
379. Steering bracket for locomotive boiler wagons (photo: Stan Nipper).
Fig 123 and **124**. Details of the operating gear controls.



the G/A. Each channel is drilled for clearance for the cross shaft and an oval cast iron bracket, one each side, provides the bearing for the shaft. A diagonal reach rod then connects with the pump cock on the left-hand side of the engine, the arrangement illustrated in **photo 375**. It may be seen that the builder has made the length of the reach rod adjustable.

Steering column brackets

The steering wheel is fixed on top of the vertical steering shaft, except on the version of our lorry with the locomotive boiler where it is slightly angled backwards. In both cases it is situated just ahead of the driver. The change is due to the locomotive boiler having a longer footprint than the vertical and water tube boilers, which necessitated a slightly longer cab so the driver's seat ended up rather further back. Since the road wheel centres and steering gear are common to all vehicles, in order for the steering wheel to remain at easy arms length on the locomotive version the steering shaft is angled back by 9 degrees.

To make the steering bracket the drawings call for $\frac{1}{4} \times \frac{3}{32}$ in. thick strip, but $\frac{1}{8}$ in. strip would

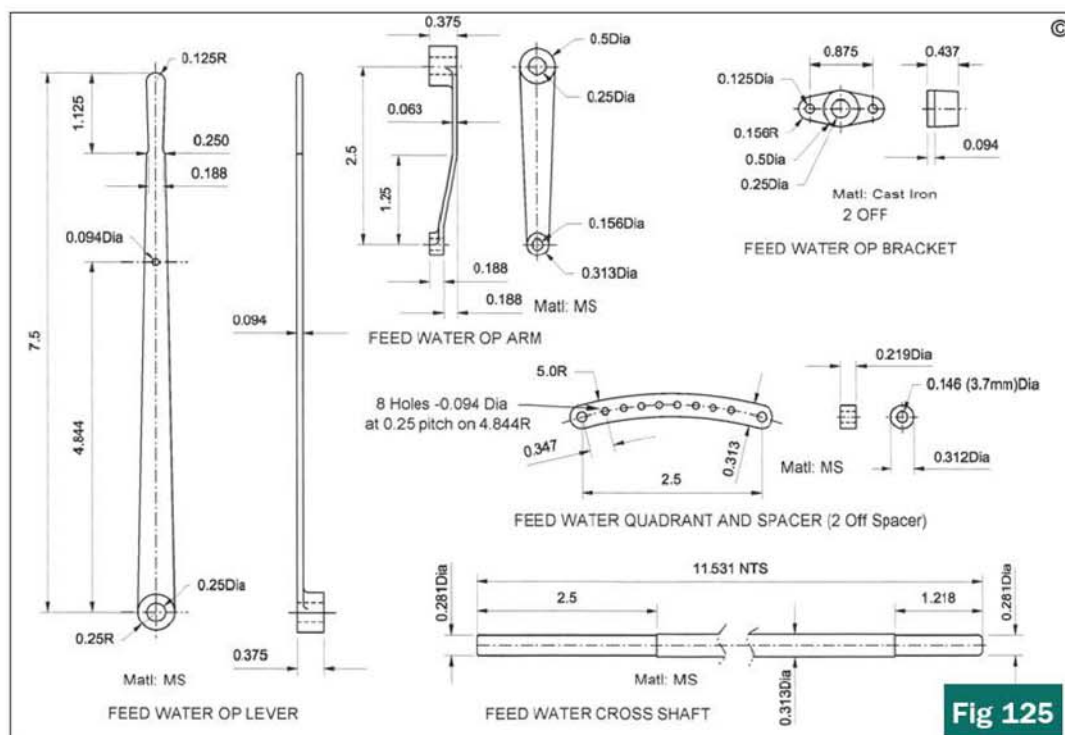


Fig 125

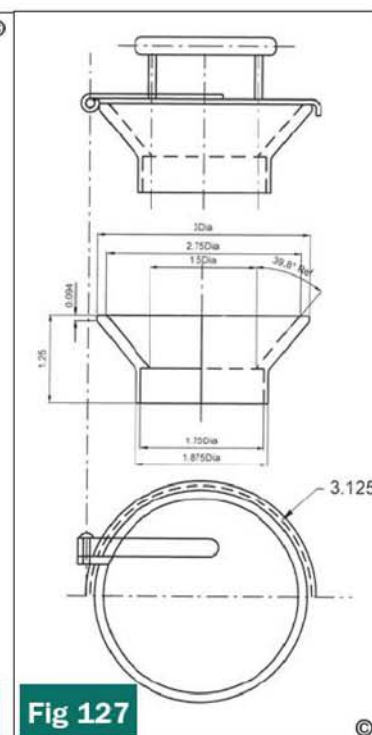


Fig 127

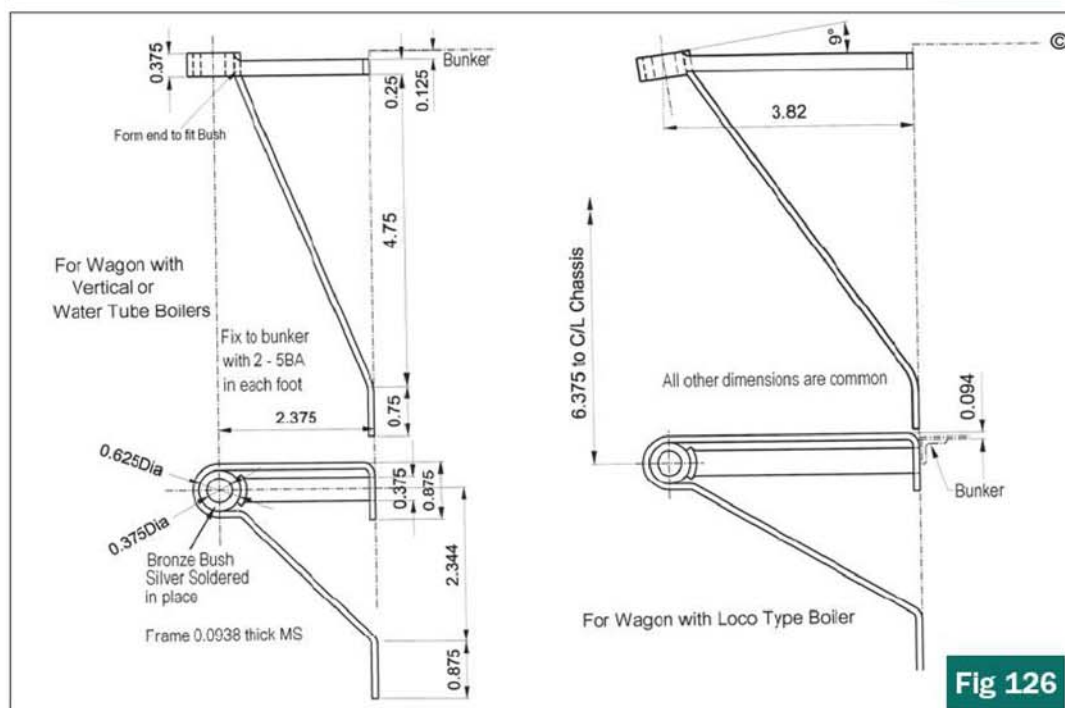


Fig 126

Fig 125. Feed water operating arm and details.
Fig 126. Steering column brackets.
Fig 127. Coal chute for vertical boiler.

be fine if the thinner section cannot be easily sourced. It ought to bend readily enough cold but some local heat would make it easier; one of the main benefits of attending an evening class is the availability of oxy-acetylene for these little jobs.

A jig may be made to hold the three parts of the bracket together when silver-soldering, or possibly, with care, the parts may be soldered in situ on the model itself - particularly on the locomotive boiler model as the 9deg. angle has to be taken into

account. Do not use the steering shaft proper when soldering just in case it ends up silver-soldered to the bracket. The two bracket designs are illustrated in **photos 378 and 379**.

Mechanical lubricator

The correct location for the mechanical lubricator is on a cast bracket attached to the exhaust steam feed water heater on the left-hand side of the engine. In practice most builders are, correctly in your authors' opinion, choosing to

omit the feed water heater so another method of attaching the mechanical lubricator is required. A clever solution devised by friend Ray has a rod taking the drive from the boiler feed pump (see photo 375) to the lubricator box, which is hidden under the seat. This location also means an over scale box and mechanism may be fitted without the loss of the scale outline. A larger size of lubricator, as with injectors, ought to be more reliable in service, and since the lubricator

drive from the pump is already geared down it ought not to over oil. If it persists in over oiling the ratchet may simply be reduced to just one click which will certainly curb its enthusiasm.

The oil feed is routed over the top of the engine to the main steam bend on the HP side where a special boss is provided for the oil feed. It is wise to fit a non-return valve in the oil line to make sure steam/condensate cannot find its way into the lubricator box. It is wise to plan for an occasional misfortune so design your lubricator box to be nice and easy to remove so if servicing is required it may be done in comfort on the bench.

Mentioning the coal chute earlier has reminded me that the drawings for it have yet to be published as they were not finalised at the time. With the editor's permission I herewith publish them now.

● To be continued.

THE MODEL ENGINEER EXHIBITION

7th - 9th September 2007 Ascot

Please return completed form to:
Model Engineer Competition,
9 Tranmore Lane, Eggborough,
E. Yorkshire DN14 0PR

ENTRY NO.

OFFICE USE ONLY

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CLASS	ENTRY NO.

ENTRY FORM - COMPETITION & LOAN MODELS

PERSONAL DETAILS (Please print)

Surname _____ Forename(s) _____ Age: _____

Address _____

_____ Post Code: _____

Home Tel No _____ Daytime Tel No _____

Model Club or Association _____

Have you entered before? (Y/N) _____

Do you purchase or subscribe to a Magicalia Publishing Ltd magazine? (Y/N) _____

How many years have you been a modeller? _____

Mail Order Protection - please tick this box if you would prefer not to receive mail from other companies which may be of interest to you ☐

MODEL DETAILS - PLEASE TICK BOX IF MODEL IS FOR LOAN ☐

Entry Class (competition entries only) _____

Model Title (to be used for catalogue and display card) _____

Model Description _____

Model Scale _____ Length _____ Width _____ Height _____ Weight _____

Type of construction _____

Parts not made by you and commercial items _____

Have you supplied a photograph? (Y/N)

Are you supplying Judges Notes? (Y/N)

Value of Model (Magicalia Publishing Ltd will not insure the model unless a value is entered) £ _____

Name and address of your local newspaper _____

To help you get the best from The Model Engineer exhibition

These notes are written purely for guidance. Full information is contained in the Competitors' Information booklet which is sent to every entrant as part of the information package. If you have an item and are unsure as to the Class into which it should be entered, leave that section blank and we will take care of it. The Judges have the right to move any competition exhibit into another class if they feel that by doing so its chances of gaining higher marks or a more appropriate award are improved.

If the item is offered as a Loan exhibit please indicate this by writing Loan on the form in the box identifying the Class. Loan models are not judged but carry all other privileges associated with competition entries.

Part built models are particularly welcome in the Loan Section; visitors like to see work in progress, and entry does not preclude the item being entered in competition when completed.

The classes listed below are those associated with mainstream model engineering.

Club exhibits

Where a club is exhibiting, each model should be entered on a separate entry form and clearly identified as a club exhibit by entering Loan/Club in the class section box. This ensures that we have a full record of all models on display during the show and facilitates matters of administration and insurance.

Additional forms

If you do not wish to deface your copy of the magazine we are happy to receive photocopies of the entry form, one for each model. We will be pleased to send out extra forms if required, so if you know of a modeller who is not a reader of one of our magazines but who you think may wish to participate, please advise them to contact our Exhibitions Office, or simply photocopy the entry form for them.

The success of the show depends largely on the number of models on display. Your work could well be the stimulus which inspires someone else to start in the hobby. There can be no doubt that this event is our showcase on the world of modelling in all its aspects. Every modelling discipline needs more and more participants, and it is by displaying not only the crème-de-la-crème, but also examples of work of a more achievable standard, that people are encouraged to join into the wonderful world of modelling, in whatever aspect.

We look forward to seeing a sample of your work at the show!

Engineering Section

- A1 Hot air engines.
- A2 General engineering models (including stationary and marine engines).
- A3 Internal combustion engines.
- A4 Mechanical propelled road vehicles (including tractors).
- A5 Tools and workshop appliances.
- A6 Horological, scientific and optical apparatus.
- A7 General engineering exhibits – not covered by the above

Railway Section

- B1 Working steam locomotives 1" scale and over.
- B2 Working steam locomotives under 1" scale.
- B3 Locomotives of any scale, experimental, freelance or based on any published design and not necessarily replicas of full size prototypes, intended for track duties.
- B4 Scratchbuilt model locomotives of any scale, not covered by classes B1, B2, B3, including working models of non-steam, electrically or clockwork powered steam prototypes.
- B5 Scratchbuilt model locomotives gauge 1 (10mm scale) and under.
- B6 Kitbuilt model locomotives gauge 1 (10mm scale) and under.
- B7 Scratchbuilt rolling stock, gauge 1 (10mm scale) and under.
- B8 Kitbuilt rolling stock, gauge 1 (10mm scale) and under.
- B9 Passenger or goods rolling stock, above 1" scale.
- B10 Passenger or goods rolling stock, under 1" scale.
- B11 Railway buildings and lineside accessories to any recognised model railway scale.
- B12 Tramway vehicles.

Marine Models

- C1 Working scale models of powered vessels (from any period). Scale 1:1 to 1:48
- C2 Working scale models of powered vessels (from any period). Scale 1:49 to 1:384

- C3 Non-working scale models (from any period). Scale 1:1 to 1:48
- C4 Non-working scale models (from any period). Scale 1:49 to 1:384
- C5 Sailing ships and oared vessels of any period – working.
- C6 Sailing ships and oared vessels of any period – non-working.
- C7 Non-scale powered functional models including hydroplanes.
- C8 Miniatures. Length of hull not to exceed, 15in for 1:32 scale, 12in for 1:25 scale, 10in for 1:16 scale; 9in for 1:8 scale. No limit for smaller scales.
- C9 For any model boat built from a commercial kit. Before acceptance in this class the kit must have been readily available for at least 3 months prior to the opening date of the exhibition and at least 20 kits must have been sold either by mail order or through the retail trade.

Scale Aircraft Section

- D1 Scale radio control flying models
- D2 Scale flying control-line and free flight
- D3 Scale non-flying models, including kit and scratch-built
- D4 Scale flying radio controlled helicopters

Model Horse Drawn Vehicle Section

- G1 Carriages & other sprung vehicles. (Omnibuses, trade vans etc.) Wagons, carts and farm implements. Caravans.

Junior Section

- J1 For any type of model, mechanical or engineering work, by an under 14 year old.
- J2 For any type of model, mechanical or engineering work, by an under 16 year old.
- J3 For any type of model, mechanical or engineering work, by an under 18 year old.

All entries will be judged for standard of craftsmanship, regardless of the modelling discipline, i.e. a boat will not be competing against a military figure. Providing a model attains sufficient marks it will be awarded a gold, silver or bronze medal.

Model Vehicle Section

- K1 Non-working cars, including small commercial vehicles (e.g. Ford Transit) all scales down to 1/42.
- K2 Non-working trucks, articulated tractor and trailer units, plus other large commercial vehicles based on truck-type chassis, all scales down to 1/42.
- K3 Non-working motor bikes, including push bikes, all scales down to 1/42.
- K4 Non-working emergency vehicles, fire, police and ambulance, all scales down to 1/42.
- K5 Non-working vehicles including small commercial vehicles (e.g. Ford Transit,) scale from 1/43 or smaller.
- K6 Any available body shells including Concours, in any scale or material, to be judged on appearance only.
- K7 Functional model cars/vehicles which must be able to move under its own power of any type. Can be either free-running, tethered radio controlled or slot car, but must represent a reasonable full size replica.

DUKE OF EDINBURGH CHALLENGE TROPHY

Rules and Particulars

1. The Duke of Edinburgh Challenge Trophy is awarded to the winner of the Championship Award at the Model Engineer Exhibition.
2. The trophy remains at all times the property of MAGICALIA PUBLISHING LTD.
3. The name of the winner and the date of the year in which the award is made will be engraved on the trophy, which may remain, at the discretion of MAGICALIA PUBLISHING LTD., in his/her possession until required for renovation and display at the following Model Engineer Exhibition.

4. Any piece of model engineering work will be eligible for this Championship Award after it has been awarded, at The Model Engineer Exhibition, a Gold or Silver medal by MAGICALIA PUBLISHING LTD. No model may be entered more than once.
5. Entry shall be free. Competitors must state on the entry form:
 - (a) That exhibits are their own bona-fide work.
 - (b) Any parts or kits which were purchased or were not the outcome of their own work.
 - (c) That the model has not been structurally altered since winning the qualifying award.
7. MAGICALIA PUBLISHING LTD. may at their sole discretion vary the conditions of entry without notice.

COMPETITION RULES

1. Each entry shall be made separately on the official form and every question must be answered.
2. Competition Application Forms must be received by the stated closing date. LATE ENTRIES WILL ONLY BE ACCEPTED AT THE DISCRETION OF THE ORGANISERS.
3. Competitors must state on their form the following:
 - (a) Insured value of their model.
 - (b) The exhibit is their own work and property.
 - (c) Parts or kits purchased.
 - (d) Parts not the outcome of their own work.
 - (e) The origin of the design, in the case of a model that has been made by more than one person.

NOTE: Entry in the competition can only be made by one of the parties and only their work will be eligible for judging.

4. Models will be insured for the period during which they are in the custody of MAGICALIA PUBLISHING LTD.
5. A junior shall mean a person under 18 years of age on December 31st in the year of entry.
6. Past Gold and Silver medal award winners at any of the exhibitions promoted by MAGICALIA PUBLISHING LTD. are eligible to re-enter their model for the 'Duke of Edinburgh Challenge Trophy'. Past winners at any of the exhibitions promoted by MAGICALIA PUBLISHING LTD. will not be eligible for re-entry into the competition unless it has been substantially altered in any way.
7. MAGICALIA PUBLISHING LTD reserve the right to:
 - (a) Transfer an entry to a more appropriate class.
 - (b) Describe and photograph any models entered for competition or display and to make use of any such photographs and descriptions in any way they may think fit.
 - (c) Refuse any entry or model on arrival at the exhibition and shall not be required to furnish a reason for doing so.
8. Entry into the competition sections is not permitted by:
 - (a) Professional model makers.
 - (b) Anyone who has a financial interest in the direct supply of materials and designs to the public.

NOTE: If unsure, please contact the Competition organisers prior to the show.

9. The judges' decision is final. All awards are at the discretion of the judges and no correspondence regarding the awards will be entered into.
10. Exhibitors must present their model receipt for all models collected at the end of the exhibition and sign as retrieved.
11. The signed release for each model must be presented to security staff when leaving the exhibition complex with display model(s) after the close of the exhibition.

IMPORTANT NOTE: PLEASE MAKE COPIES, INCLUDING PHOTOGRAPHS, OF ALL INFORMATION RELATING TO YOUR MODEL, AS MAGICALIA PUBLISHING LTD WILL NOT ACCEPT LIABILITY FOR ANY LOSS.

CLOSING DATE 24TH AUGUST 2007

Hints on using tinsnips

Despite the many modern aids for cutting metal now available to the home worker there are still many occasions when traditional methods have to be resorted to. The humble tinsnips are a case to point and are still an essential tool when cutting thin sheet metal.

Photograph 1 shows a typical pair of modern tinsnips. They are termed the 'no-nip' pattern. Early tin snips had handles that curved round to meet at the right-hand end of those shown in the photo. They could nip your clothing or flesh in the tummy area (painful). Those shown have stops just to the right of the pivot pin and are much safer to use.

Tinsnips need to be sharpened occasionally. The angle formed by the cutting edge should be approximately 80 degrees (**photo 2**).

Like most tools there is a correct way and many incorrect ways of using these deceptively simple tools.

Take a look at **photo 3**. A couple of cuts have been made into a sheet of soft aluminium alloy. That at the top of the sheet was made without closing the blades of the snips completely whereas the blades were closed for the cut made below. It can be seen that when the blades of the tool are completely closed they leave a nasty kink at the end of the cut. This distorted area would

be very difficult to remove when the time comes to clean up the cut line.

To make a clean cut all the way across a sheet of metal start the snips as shown in the top of **photo 4** but do not let the jaws of the snips close completely until you get to the end of the cut. Practice your technique on some scrap material until you are able to control the tool correctly. **ME**

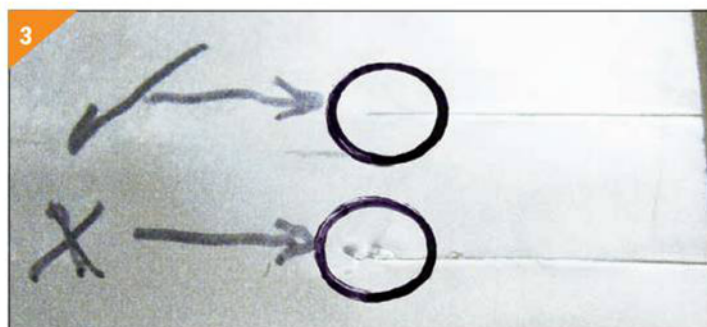
Peter Spenlove-Spenlove discusses tinsnips and how to use them properly.

1. A typical pair of tinsnips. These are 10in. long.

2. A view of one of the cutting edges of the tinsnips sharpened to an angle of 80 degrees.

3. A good and bad cut made in a piece of aluminium alloy sheet.

4. Starting the cut. Do not close the tinsnips completely (bottom picture) before advancing them to the next stage of the cut.





3F to 3F

An ambitious conversion

PART 7

Continued from page 764
(M.E. 4302, 22 June 2007)

Geoff Dowden
puts the finishing
touches to the tender
of this super model.

The appropriate dimension details of the coal rails were obtained by reference to a drawing which appeared in one of the Midland Railway Locomotive volumes previously referred to, so I was then able to set about the task of flattening approximately 8 feet of $\frac{1}{4}$ in. x 22g brass boiler band to provide the material for the horizontal components of the coal rail assembly. It was also fortuitous that in the same volume there appeared two photographs of the Johnson tender top. A little luck here I thought, as top view photographs are not always easy to find, the railway snappers much preferring to focus on the action packed front three quarter view.

Both photographs revealed that the vertical rail support brackets were fashioned from T-section material, a discovery which immediately filled me with dismay as in

seconds I realised that I had no recollection whatsoever of any of our advertisers offering what would have to be $\frac{1}{4}$ in. x $\frac{1}{8}$ in. brass T-section. Scanning of all my trade catalogues proved to be a fruitless exercise so there was no other option but to manufacture my own material, the methodology being shown as figures 26B (I – III). There is probably an easier way to achieve this objective and if perchance I should ever have to repeat the exercise, I hope that someone will have contacted me before then in order to offer a more practical alternative.

However, having successfully produced the eight required brackets these could now be attached to the plywood in the correct positions, i.e., the front edge of the forward upright at $4\frac{1}{2}$ in. from the front edge of the tender sidesheet and then at 4in. centres. The plywood had earlier been pre-formed to the shape of the tank top by applying half a dozen saw cuts, about two thirds of the way through the thickness and either side of the start of the slope to the shovelling hole; carefully bending the front end of the plywood downwards until all tendency for it to spring back had been eliminated; filling the saw cut slots with a generous amount of PVA adhesive; placing in position on the tank top; weighting down with a couple of hefty chunks of steel and then leaving to dry and harden overnight.

I considered that it would next be appropriate to attach the rails, the top one first. A 15in. length of the $\frac{1}{4}$ in. banding was therefore chopped off and checked for straightness when I was somewhat surprised to find that a peculiarity of the initial flattening exercise was that the banding had adopted a distinct curvature along its length. No doubt metallurgists and persons with a more intimate knowledge of the behavioural characteristics of metals than pseudo engineers like myself, will immediately understand the nature of the phenomenon. Unfortunately I did not, so I just set about the task of correcting

the undesired curvature, which for obvious reason, could not be allowed to remain. With the jaw protectors in place, one end of the 15in. strip was therefore gripped edge on in the vice, so that when moving along its length, one 3in. jaw width at a time, careful sideways pressure could be applied, little by little to avoid the creation of any unwanted kinks, until a final check against a straight edge revealed that the strip had returned to a sufficiently acceptable alignment for coal rail purposes.

With the plywood in position on the tank top, the strip was then attached to each upright in turn with a small engineer's clamp, allowing an equal amount of spare rail overhang at each end. The strip was clamped at a height of 1in. to the top of the rail from the top of the flare, at the same time ensuring that the clamps gripped as much as possible of the T-section midrib to prevent it coming adrift during the next phase of operations. The four brackets are then unscrewed from the plywood and transferred to the bench, complete with clamped rail, so that after appropriate preparations each bracket can be silver-soldered to the rail.

My attention now focused on the question of how to produce the radiused ends which abut onto the curve of the flare, but more particularly, how to fix the top of the vertical radiused portion of the rail to the end of the top horizontal and at the same time achieve a secure fastening at its lower end onto a small rectangular plate that is also radiused to match the curve of the flare. This situation seemed to me to be a scene from your worst nightmare and after giving the matter a great deal of thought, I concluded that the concept was impossible. Instead, I decided to attempt to fashion this 'duo' as a one piece item so that the problematic joint of the flange plate and lower end of the radius rail could be eliminated, as the plate on the flare, although riveted together on the prototype, would only 'appear'



to be so on my version and the task of fastening the radius end/flange plate combination to both horizontals would perhaps become a significantly easier job.

As practiced earlier, I resorted to the cardboard template methodology and having arrived at what appeared to be a satisfactory sample, a little further trial and error enabled me to produce a prototype sawn and filed from a small piece of 22g brass sheet rescued from the non-ferrous scrap box. **Figures 26C** show the necessary detail of the radius end/flange plate combination. However, before attempting to secure the radius end to the top horizontal, I thought it prudent to provide the flange plate portion with

the rivets that on the full size, secure it to the flare, but in this case, the rivets will be for cosmetic purposes only. After drilling $\frac{3}{64}$ in. and slightly countersinking the underside of the plate, the three rivets were inserted, excess length snipped off and then peened over in conventional fashion with a final needle file dressing to ensure a continuing close fit of flange plate to flare.

The embryo rail assembly was then re-attached to the plywood and repositioned on the tank top so that the end radius/fixing flange could be clamped in the correct position on the top edge of the flare to establish the line where its upper end needs to be trimmed in order for it to be a close fit to the lower edge

of the top rail. After scribing, the radius rail is removed, trimmed to size and when a satisfactory fit is achieved, it is re-clamped to the top rail and the assembly removed from the plywood in order for the radius end to be silver soldered to the rail, clamping the adjacent bracket to prevent unwanted detachment of the midrib during this operation. My first attempt at this task was carried out without removing the assembly from the plywood when in spite of my precautions to protect the wood from the torch flame and the effects of the degree of heat necessary for silver soldering, the exercise came very quickly to a halt as the fog which was rapidly generated from the smouldering timber triggered the workshop smoke alarm (my workshop is located in a spare bedroom of the house), prompting instant enquiries from my good lady downstairs as to the state of my health, or in retrospect was it something more like "What on earth do you think you are doing etc., etc?" – or words to that effect! The resultant

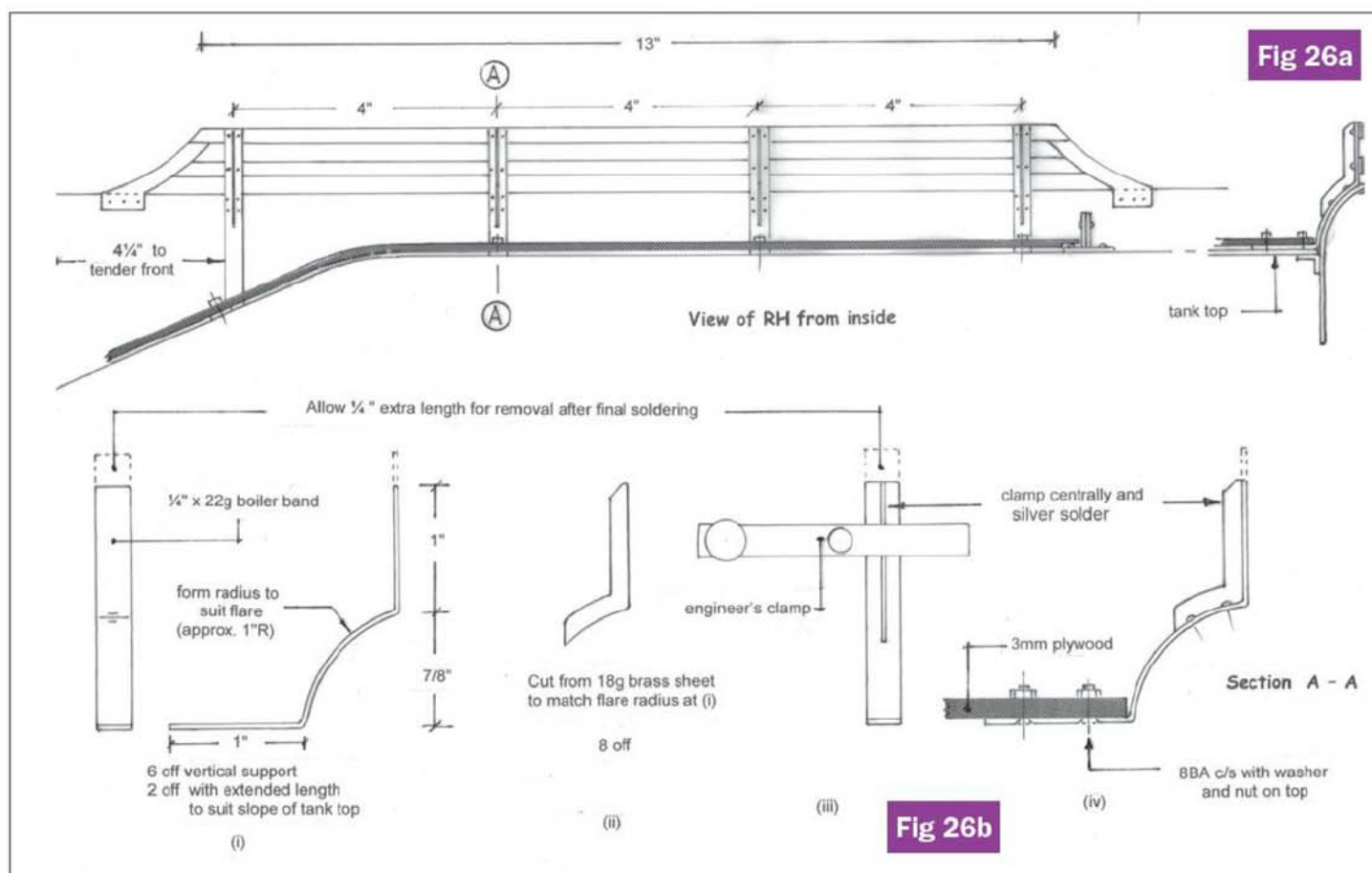
6. Completed coal rails.

Fig 26a. Coal rails

Fig 26b. T-section assembly.

missing portion of plywood was ultimately restored by filling the gap created with Rustin's plastic wood. After refitting the rail assembly to the plywood and a trial fitting in the tender top, I was sufficiently encouraged by the result to produce a similar radius rail/flange unit for the opposite end, remembering to bend the fixing flange plate in the opposite direction, whereupon the whole exercise was repeated.

As an aid to keeping things where they should be, I decided for the next task it would be sensible to fit the rivets that on the prototype fasten the rail to the brackets. The latter were therefore drilled $\frac{3}{64}$ in. either side of the midrib and central to the rail, slightly countersinking the outside of the rail before inserting the rivets from the inside, treating in the usual fashion and finishing off with a ➤





flat needle file so as to leave no trace of the fixing rivets, as appears to be the case on photographs of the full size example. The lower coal rail was then offered up and one end scribed against the curve of the inner radius of the end rail so that it could be filed to a good matching fit. This achieved, the lower rail was then clamped in position to scribe the opposite end and filed to shape as before. Once satisfied with the fit at both ends, the rail is clamped to each upright maintaining the gap along the length, and the assembly removed from the plywood for silver soldering the two centre uprights to the rail, followed by the outer ends

which are additionally secured to the inner edge of the radius end. I must confess that at the time, my sample resembled an object from outer space as there were clamps and Bulldog clips everywhere in an effort to prevent previous work from being undone. I had exhausted my collection of engineer's clamps and I recall that the spring steel of one of a number of Bulldog clips called into action, coloured bright crimson during the operation and of course, on cooling, I discovered that the thing had been rendered quite useless for its intended purpose and therefore any future repeat performance! Drilling and riveting of the lower rail as before was



then all that was required to complete the assembly.

Pleased with the overall result after cleaning up, trimming off the excess at the ends of the rail, the tops of the uprights and re-attaching to the plywood, no time was lost in producing a second assembly for the other side of the tender, the photograph I think conveying the appropriate effect even before covering the top with a layer of coal.

At this point all that remained to complete the tender construction was to produce the radius at the front top corner of both the sidesheets, fit the flat beading, (produced from $\frac{5}{16}$ in. wide boiler banding), to the

Fig 26c. Coal rail end detail
7. Tender front assembly.
8. The completed tender.

side and rear sheets and the $\frac{1}{8}$ in. half round beading to the top edges of the three vertical panels. Following painting, the tender number and water capacity plates will then be permanently attached above and below the central upper lamp iron.

That completes building the tender. Next time we return to the plating on the locomotive.

● To be continued.

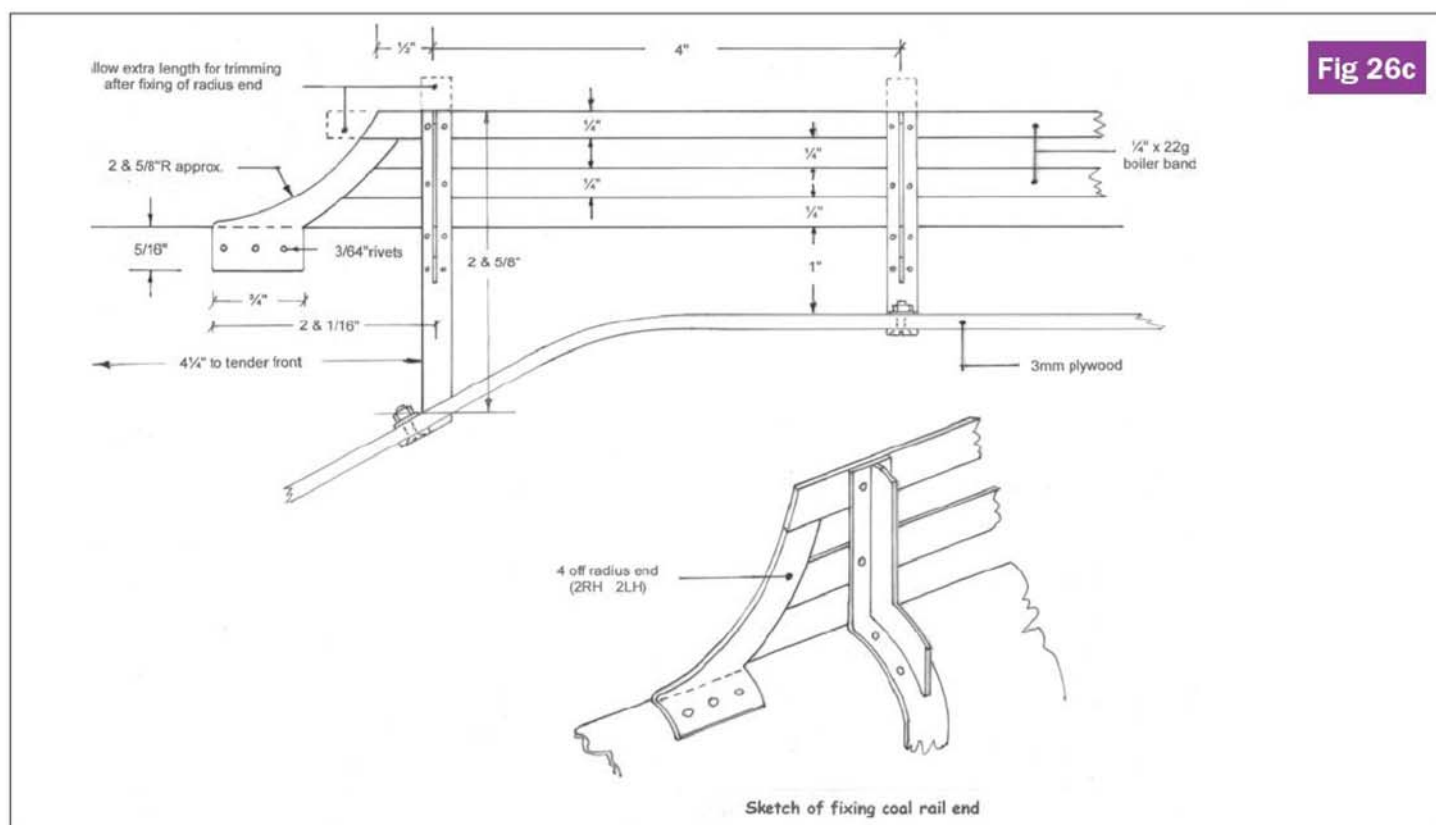
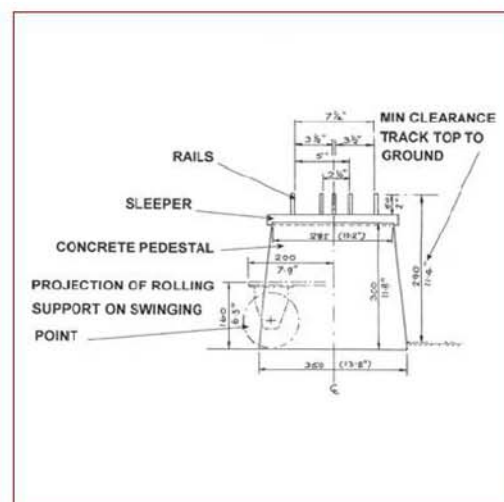


Fig 26c

David Everingham, 115 Tom Lane, Fullwood, Sheffield S10 3PE (T. 01142 306041).



Notices

I have received the following notice from **The Old Locomotive Committee**:

"Lionsmeet will be hosted this year by the **Bristol Society of Model and Experimental Engineers** at Ashton Court Estate, Bristol on Sunday 29 July 2007.

Lionsmeet is an informal annual gathering of all those with an interest in the Liverpool and Manchester Railway locomotive *Lion* in all its manifestations and gauges. All such persons are invited to bring their locomotives, in any gauge, finished or not, and any *Lion* memorabilia they may have to the event for display or demonstration. There will be a competition, limited to 3½in., 5in. and 7¼in. gauge engines, to establish the hardest working *Lion* based on the measurement of work done by the engine during a 10 minute run. The track will be open to those wishing to practise from

10:00am and the competition will start at 1:00pm. Period dress is optional. Prior application is unnecessary, but further information and directions are available from Alan Bibby, E. alan_pb@yahoo.co.uk, or T. 01254 812049".

The **Maxitrak Owners Club** (www.moc.org.uk) has informed us that the annual rally will again be held at the Leatherhead track site of the **Surrey SME**. The event this year will be held on Saturday 4 August.

The 11th Sacrewell Miniature Traction Engine Rally organised by **Peterborough SME** will be held at Sacrewell Farm & Country Centre this weekend, 21/22 July. The event will feature working traction engines, model boats and other displays and will be open each day from 10:00am until 5:00pm. Further details can be obtained from the club website at www.peterboroughsme.co.uk

I have received details of an event at the **Midland Railway Society**. The meeting on Saturday 8 September will be a talk by John Downing on 'London Suburban Services on the Midland Main Line'. The meeting commences at 11:00am and will be held at the European Inn, Midland Road, Derby. Further details can be obtained from the website at www.midlandrailwaysociety.org.uk or T. 01462 451090.

The society is affiliated to the **Midland Railway Study Centre** which is described as a "unique assemblage of objects, documents and books" for researchers and anyone who wants to discover more about the Midland Railway and its activities. For modellers, the centre holds engineering drawings of rolling stock, locomotives and other railway furnishings. Many of these came from the original Derby works. The centre is only accessible by appointment at PO Box 7123, Derby DE65 9AP or E. enquiries@midlandrailwaystudycentre.org.uk The centre website is at www.midlandrailwaystudycentre.org.uk

midlandrailwaystudycentre.org.uk

UK Club News

The **National 2½" Gauge Association** is attracting lots of new members and the series on building *Ayesha II* is generating lots of demand for price lists for the castings.

The exhibition put on by the **Bournemouth DSME** at the Ringwood Town and Country Museum was a great success with a large variety of models on display and a good attendance by visitors. From the report in the newsletter, there seemed to be lots of cake of various varieties consumed during the two days. In fact the subject of cream cakes featured again on Sunday 22 May when "cream teas and cakes were laid on by the ladies and enjoyed by all that attended". Perhaps our Editor would like me to visit the society some time?

The winter work at **Cambridge MES** has included relaying the track from the signal box to the new diamond crossing near the coach shed. The opportunity was taken to make access easier to the coach shed. A new triple gauge point is to be made to complete the job. The new workshop has the interior lining 75% complete and the newly acquired Beaver vertical milling machine has been delivered. The old workshop will be used for "rough" work such as cutting, grinding and welding. It will also be used to store metal and other items. Plastic mesh has been laid over the car park surface to prevent cars sinking into the grass.

East Somerset SMEE has taken the step to become a company limited by guarantee. This has now happened and should ensure that the interests of both the members and the society are protected in the future. The new signal box name was chosen by a ballot at the AGM and the name *Prestleigh Brook Signal Box* was the clear winner. John Morgan has made a sign for the outside. There are several *Sweet Pea* locomotives being built in the club and rumour has

From Malcolm Stride

1. Ian Johnson from North London SME with his 7¼in. gauge bicycle.



it that one of them may be a flash steam version.

The March public running session at **Frimley and Ascot Locomotive Club** turned out to be a wash-out and the running was stopped after a couple of hours due to a lack of passengers willing to get wet! The April run was much better with an excellent turnout which made up for the lack of return in March. In order to separate information about the Frimley Lodge Railway and the club activities, the society is setting up an additional website for the latter at www.falc.org.uk. The original site (www.flmr.org.uk) will remain as the source of railway information. The new site is still under construction at the time of writing.

The new station canopy at **Hereford SME** has been completed in time for the new running season. The canopy will have been officially "opened" by Bernadette Kearney from BBC television by the time you are reading this. Planning consent is to be sought for a new mess building and toilets in time for work to be carried out next winter.

KINLEC, the **Kinver and West Midlands SME** efficiency competition will be held this year on the 4 August and members are no doubt busy preparing their locomotives for the event. John Cowley has been building a dynamometer car for such events. Warwick Jackson has taken over the task of producing the *Kinver Link* newsletter following the sad death of Brian White, the previous Editor. Alan Bellamy is organising KINLEC and also a beer and skittles evening in September. The competition at the latter event will be against the Stourbridge Pre-War Car Club. A fish and chip supper will also be included.

In the *Factory News* section of the **Maxitrak Owners Club** newsletter, the company announces that it has a new source of boilers for its locomotives and the new boilers will be MIG welded copper with only the bushes being silver-soldered in place. The same announcement also

carries the information that the United Kingdom is the only place where stainless-steel boilers are not accepted. The rest of Europe and America use the material widely and there are new grades of stainless steel available for such purposes.

Work at the **North Cornwall MES** is being concentrated on replacement of some of the ageing track support poles. These are old telegraph poles and have been in situ since the track was built 30 years ago. Eight members started the task armed with picks, shovels, chainsaws and crowbars and several supports were dealt with. The next step is to pour some concrete in the holes and then cut and insert replacement poles. Members are warned to check the track before attempting to run in the interim. I hope they take note so that I am not reporting that someone drove their locomotive down a gap in future! It has been agreed to provide a model boating pond on the site. Members are relieved to know that the main excavation will be carried out using a mechanical digger.

Ian Johnston from the **North London SME** has decided to make use of an exercise bike by converting it to run on the 7 $\frac{1}{4}$ in. gauge track (**photo 1**). It was proposed at the April meeting that Ian become the Section leader of the new "Ground Level Cycling Club". Ian is contemplating fitting a trimmer engine for propulsion. Since I have a redundant cycle parked beside the workshop, perhaps this is a way for me to

stop all those comments along the lines of "you ought to get more exercise"!

The 7 $\frac{1}{4}$ in. gauge track extension at **Nottingham SMEE** was opened on 25 May this year and the society is hoping that it will create interest from those who build and run the larger gauge locomotives. The 5in. gauge track steaming bay canopy is being redesigned to include a lantern light and so is taking a little longer than anticipated. Mike Firth was elected to the post of Chairman at the AGM, replacing Geoff Hennell who has reverted to being a "civilian" although he still produces *Kingpin*, the excellent newsletter.

The March Talk Night at **Peterborough SME** featured a presentation by Alan Whenman from the Nene Valley Railway. Alan described the rebuilding of the locomotive 92 *Squadron* and covered the process from the start in Woodham's scrapyard to the steaming and running some 20 years later.

The newsletter of the **Tonbridge MES** has a small piece on commercial uses of Stirling engines including a hot air engine powered Visby class stealth corvette made by Swedish company Kockum. The same company produces the *Gotland* class submarine powered by two hot air engines. The vessel can remain submerged for weeks and is virtually undetectable when submerged.

World Club News

Canada

The working party fitting anti-tip rails to the raised track at the

British Columbia SME had a pleasant interruption recently when Phil Macdonald arrived with a 5in. gauge 02 0-4-4T locomotive to test. Work soon stopped whilst the locomotive was successfully test run. Construction of the locomotive was started by the late Harry Cook and Phil has completed it for Harry's family. In spite of the interruption, some anti-tip rail was installed.

New Zealand

Members of **Auckland SME** visited Murray Lane's workshop for a demonstration evening showing various operations on the machines. Murray had set up various jobs in nearly all of his machines ready for the evening. Several newer members attended and no doubt picked up many hints and tips during the course of the evening. At the track site, the design and overhauling of the traverser and steaming bay is underway and the President has warned members that the project will require volunteers at a later date to carry out the work.

Junior News

Readers may recall that I recently mentioned the steam engine constructed by Nicholas Wright, a junior member of **Bradford MES** (M.E. 4298, 27 April 2007). I have since received more information from Nicholas about his engine. >>

2. Nicholas Wright's 'Meccano' locomotive.





Nicholas gave a talk to the members on how he developed the engine. I include Nicholas' description of his engine as received "My Meccano steam locomotive (**photo 2**), runs on methylated spirit and has one piston with forward and reverse positions. It also has two reduction gears and a Meccano sprocket chain. There are two Meccano flange wheels at the front and the back wheels are made from plastic wheels with bigger wheels on the inside that form the flanges. It runs on 3½ in. gauge track and achieved just over four laps of the BMES track (2,024ft. or 617m), with one filling of methylated spirit. This was better than my first locomotive design which had only one reduction gear with a rubber band drive and covered only 3½ laps of the track (1,540ft. or 469m)".

I am sure all readers will congratulate Nicholas on his efforts and I am sure we will hear more from him in the future. His efforts also show that youngsters can get actively involved in model engineering without having lots of equipment or other resources.

I would like to include more news items about the efforts of junior model engineers in future so if you think the activities of juniors in your club are worthy of note, please send in details.

Trade News

JML Claritweezer

Those model engineers who work with smaller items such as those found on small gauge locomotives, watches and small scale model boats may be interested in the new tweezers (**photo 3**) from JML. Those, like me, who have trouble focussing to a distance less than 3ft., will also find them invaluable not least when removing metal splinters from the fingers. They feature a retractable 2x magnifying lens and a built in LED light to illuminate the work and will be available from late August at Boots stores or direct from JML via the website at www.jmldirect.com. The price will be £7.99 including a clip-on cover, a soft carrying case and a free eyebrow brush which may well get some brownie points from the master of the house, always assuming she does not take a fancy to the tweezers themselves!

Steamfittings.co.uk

Details about this company appeared in the 2½ inch Gauge Association journal. The company produces a full range of steam fittings and accessories and has a secure

ordering facility on the website (www.steamfittings.co.uk).

Importantly orders are on the basis of a 14-day money back guarantee.

The range of products is very complete ranging from boiler blanking plugs to steam raising blowers. The company is based in Daventry and full contact details are SteamFittings.co.uk, 36 Elder Drive, Daventry, Northants NN11 5XE T: 01341-280637 and 07866-424822, E: sales@steamfittings.co.uk

Model Engineering on the Internet

The following site was noted in the **Fylde SME** newsletter for those interested in designing locomotive valve gear: www.avocetconsulting.com.au/modeleng/. The relevant Windows files can be downloaded from the site.

Humour Time

The following are actual quotes from the instruction manual for a Chinese lathe newly acquired by a correspondent:

"Wear gabardine approved safety glass and face shield while using this machine to make maintenance"

3. The new claritweezer from JML may prove useful to modellers.

and

"Forbidden to wear gloves, high heeled shoes and skirts."

Suggestions for the correct meaning will be gratefully received and passed on to the owner of the machine.

I should add that the person concerned is very pleased with his new machine.

The following revised version of the tale of the three bears was found in the **Nottingham SMEE Kingpin**:

"Baby bear sits in his small chair at the table. He looks into his bowl. It is empty. "Who's been eating my porridge?" he squeaks. Daddy Bear arrives at the table and sits in his chair. He looks into his bowl and it is also empty. "Who's been eating my porridge?!" he roars.

Mummy Bear puts her head through the serving hatch from the kitchen and yells, "For God's sake, how many times do I have to go through this with you idiots? It was Mummy Bear who got up first. It was Mummy Bear who woke everyone in the house. It was Mummy Bear who made the coffee. It was Mummy Bear who unloaded the dishwasher from last night and put everything away. It was Mummy Bear who swept the floor in the kitchen. It was Mummy Bear who went out in the cold early morning air to fetch the newspaper. It was Mummy Bear who set the table. It was Mummy Bear who walked the dog, cleaned the cat's litter tray, gave them their food, and refilled their water. And now that you've decided to drag your sorry bear-backsides downstairs and grace Mummy Bear with your grumpy presence, listen carefully, because I'm only going to say this once..."

I haven't made the DAMN porridge yet!!!!"

I suspect that about 50% of the population will have a lot of sympathy with this version!

In Memoriam

It is with the deepest regret that we record the passing of the following members of model engineering societies. The sympathy of staff at *Model Engineer* is extended to the family and friends they leave behind.

Cyril Carter
Brian White

Romney Marsh MES
Kinver and West Midlands SME

DIARY DIARY DIARY DIARY DIARY DIARY DIARY DIARY DIARY DIARY

JULY

- 20-21 The 40th Model Steam Rally & Exhibition at Stoke Park, London Road, Guildford, Surrey.** 11.00-5.00 each day. Adults: £6, Concessions: £5, Children under 16 free.
- 20-22 Brandon DSME.** *Weeting Steam & Country Show.* Contact John Martin: 01842 75 2493.
- 20-22 Oxford (City of) SME.** *Dreaming Spires Rally.* Contact Chris Kelland: 01235 770836.
- 20-22 Plymouth MSLS.** *Boconnoc Rally.* Contact Malcom Preen: 01752 778083.
- 20 Rochdale SMEE.** *Visit to East Lancashire Railway.* Contact Bob Denyer: 0161 959 1818.
- 20 Romford MEC.** *Track Maintenance.* Contact Colin Hunt: 01708 709302.
- 21-22 Guildford MES.** *40th Model Steam Rally & Exhibition.* Contact Dave Longhurst: 01428 605424.
- 21 Leyland SME.** *Learner Drivers Afternoon.* Contact A. P. Bibby: 01254 812049.
- 21-22 Peterborough SME.** *11th Sacrewell Miniature Traction Engine Rally.* Contact Ted Smith: 01775 640719.
- 21 Plymouth MSLS.** *Public Running.* Contact Malcom Preen: 01752 778083.
- 21 Romney Marsh MES.** *Boiler Testing.* Contact John Wimble: 01797 362295.
- 21 Westland & Yeovil DMES.** *Track Running Day.* Contact Gerald Martyn: 01935 434126.
- 22 Bedford MES.** *Public Running 11am -4-30pm.* Contact Ted Jolliffe: 01234 327791.
- 22 Bristol SMEE.** *Public Running.* Contact Trevor Chambers: 0145 441 5085.
- 22 Cambridge MES.** *Members' Steam-Up.* Contact Tim Coles: 01954 267359.
- 22 Harlington LS.** *Public Running.* Contact Peter Tarrant: 01895 851168.
- 22 Maidstone MES (UK).** *Public Running.* Contact Martin Parham: 01622 630298.
- 22 Norwich DSME.** *Public Running.* Contact Shirley Berry: 01379 740578.
- 22 Nottingham SMEE.** *NSMEE Summer Gala & Public Running.* Contact Pete Towle: 0115 987 9865.
- 22 Romford MEC.** *Trackside Afternoon.* Contact Colin Hunt: 01708 709302.
- 22 Saffron Walden DSME.** *Public Running.* Contact Jack Setterfield: 01843 596822.
- 22 Staines SME.** *Public Running.* Contact Stan Bishop: 01784 241891.
- 22 Taunton ME.** *Public Running.* Contact Don Martin: 01460 63162.
- 22 Worthing DSME.** *Public Running.* Contact Bob Phillips: 01903 243018.
- 22 York City & DSME.** *Running Day.* Contact Pat Martindale: 01262 676291.
- 23 Bedford MES.** *Your other interests evening - tell us a bit about your other hobbies.* Contact Ted Jolliffe: 01234 327791.
- 24 Romney Marsh MES.** *Track Meeting.* Contact John Wimble: 01797 362295.
- 26-28 New Jersey Live Steamers, Inc.** *Members' Weekend.* Contact Karl Pickles: 718 494 7263.
- 26 Sutton MEC.** *Evening Steam-Up.* Contact Bob Wood: 0208 641 6258.
- 26 Welling DMES.** *Model R/C & I/C Night.* Contact Bob Underwood: 020 8859 6919.
- 26 Worthing DSME.** *Michael Wheelwright: Steam Loco Development.* Contact Bob Phillips: 01903 243018.
- 27-28 Canvey R&MEC.** *Open Days.* Contact Brian Baker: 01702 512752.
- 27 Chichester DSME.** *OGM.* Contact Brian Bird: 01243 536468.
- 27-31 Isle of Wight MES.** *Thomas Weekend.* Contact Malcolm Hollyman: 01983 564568.
- 27 Newton Abbot & District MES.** *Meeting.* Contact Graham Day: 01626 772739.
- 28 Bristol SMEE.** *Fun Day.* Contact Trevor Chambers: 0145 441 5085.
- 28 SM&EE.** *Rummage Sale.* Contact Maurice Fagg: 020 8669 1480.
- 28-29 Stockholes Farm MR.** *Royal Scot Gathering.* Contact Ivan Smith: 01427 872723.
- 29 Bristol SMEE.** *Visit by Lionsmeet.* Contact Trevor Chambers: 0145 441 5085.
- 29 Canvey R&MEC.** *Model Day.* Contact Brian Baker: 01702 512752.
- 29 Cardiff MES.** *Open Day.* Contact Don Norman: 01656 784530.
- 29 Chichester DSME.** *Steam on Sunday.* Contact Brian Bird: 01243 536468.
- 29 Edinburgh SME.** *Club Track Running.* Contact Robert McLucke: 01506 655270.
- 29 Guildford MES.** *Members' Running.* Contact Dave

- Longhurst: 01428 605424.
- 29 Hereford SME.** *Public Running.* Contact Nigel Linwood: 01432 270867.
- 29 High Wycombe MEC.** *Public Running.* Contact Eric Stevens: 01494 438761.
- 29 Leighton Buzzard NG Rly.** *Narrow Gauge Model Steam Railway Event.* Enquiries: 01525 373888.
- 29 Maidstone MES (UK).** *Public Running.* Contact Martin Parham: 01622 630298.
- 29 Norwich DSME.** *Public Running.* Contact Shirley Berry: 01379 740578.
- 29 Nottingham SMEE.** *Public Running.* Contact Pete Towle: 0115 987 9865.
- 29 Old Locomotive Committee.** *Lionsmeet at Bristol Society of Model and Experimental Engineers, Ashton Court Estate, Bristol.* Contact Peter Gardner: 01252 541999.
- 29 Oxford (City of) SME.** *Public Running.* Contact Chris Kelland: 01235 770836.
- 29 Saffron Walden DSME.** *Public Running.* Contact Jack Setterfield: 01843 596822.
- 29 Welling DMES.** *Public Running.* Contact Bob Underwood: 020 8859 6919.
- 29 Wigan DMES.** *Open Day.* Contact John Chamberlain: 01744 882255.
- 31 Basingstoke DMES.** *Meeting.* Contact Guy Harding: 01256 844861.
- 31 Chelmsford SME.** *Steam-Up & Barbecue.* Contact Tom Sharich: 01277 222611.
- 31 Romney Marsh MES.** *Track Meeting.* Contact John Wimble: 01797 362295.
- AUGUST**
- 1 Bedford MES.** *School Holiday Public Running 11am -4-30pm.* Contact Ted Jolliffe: 01234 327791.
- 1 Bradford MES.** *Steam-Up & Social.* Contact John Mills: 01943 467844.
- 1 Bristol SMEE.** *Meeting.* Contact Trevor Chambers: 0145 441 5085.
- 1 Frimley & Ascot LC.** *Teddy Bear's Run.* Contact Bob Dowman: 01252 835042.
- 1 Oxford (City of) SME.** *Wednesday Running.* Contact Chris Kelland: 01235 770836.
- 1 West Wiltshire SME.** *Steaming at club track.* Contact R. Nev. Boulton: 01380 828101.
- 2 Leyland SME.** *Members' Highs and Lows.* Contact A. P. Bibby: 01254 812049.
- 2 Sutton MEC.** *Bits & Pieces.* Contact Bob Wood: 0208 641 6258.
- 3 Aylesbury (Vale of) MES.** *Track Night.* Contact Andy Rapley: 01296 420750.
- 3 Canvey R&MEC.** *Shunting Competition.* Contact Brian Baker: 01702 512752.
- 3 Maidstone MES (UK).** *Evening Run & Food.* Contact Martin Parham: 01622 630298.
- 3 North London SME.** *A Fun Competition Evening at The Track.* Contact Rachael Chapman: 01442 275968.
- 3 North Norfolk MEC.** *Road Vehicle Running.* Contact Gordon Ford: 01263 512350.
- 3 Portsmouth MES.** *Meeting.* Contact John Warren: 023 9259 5354.
- 3 Rochdale SMEE.** *Meeting.* Contact Bob Denyer: 0161 959 1818.
- 3 Romford MEC.** *Competition Night.* Contact Colin Hunt: 01708 709302.
- 4 Birmingham SME.** *Running Evening.* Contact John Walker: 01789 266 065.
- 4 Canvey R&MEC.** *Members' Only Running Day.* Contact Brian Baker: 01702 512752.
- 4 Hereford SME.** *Club Running.* Contact Nigel Linwood: 01432 270867.
- 4 Ickenham DSME.** *Public Running.* Contact David Sexton: 01895 630125.
- 4 Kinver & West Midlands SME.** *Kinver KINLEC.* Contact John Campbell: 01384 891244.
- 4 Maxitrac Owners Club.** *Maxitrac Rally at Leatherhead.* Contact Eric Penn 0208 979 4335.
- 4 New Jersey Live Steamers, Inc.** *Work Day.* Contact Karl Pickles: 718 494 7263.
- 4 Romford MEC.** *Trackside Afternoon.* Contact Colin Hunt: 01708 709302.
- 4 York City & DSME.** *Summer Meeting.* Contact Pat Martindale: 01262 676291.
- 5 Basingstoke DMES.** *Public Running.* Contact Guy Harding: 01256 844861.
- 5 Bristol SMEE.** *Public Running.* Contact Trevor Chambers: 0145 441 5085.
- 5 Cardiff MES.** *Steam-Up & Family Day.* Contact Don Norman: 01656 784530.
- 5 Frimley & Ascot LC.** *Public Running.* Contact Bob Dowman: 01252 835042.
- 5 Guildford MES.** *Driver Training.* Contact Dave Longhurst: 01428 605424.

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3. BA TAP SET (2 Taps each size) & BA DIE SET: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 BA
4. 26 TPI TAP SET (2 Taps each size) & 26 TPI DIE SET (CYCLE OR BRASS THREAD) 1/4 x 26, 3/16 x 26, 1/8 x 26, 1/16 x 26, 1/2 x 26
5. BSF TAP SET (2 Taps each size) & BSF DIE SET: 1/8, 3/16, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1"
6. BSF TAP SET (2 Taps each size) & BSF DIE SET: 1/8, 3/16, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1"
7. BSW TAP SET (2 Taps each size) & BSW DIES: 1/8, 3/16, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1"
8. BSW TAP SET (2 Taps each size) & BSW DIES: 1/8, 3/16, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1"
9. METRIC COARSE TAP SET (2 Taps each size) & METRIC DIE SET: 2, 3, 4, 5, 6, 7, 8, 9, 10, 12 m/m
10. METRIC COARSE TAP SET (2 Taps each size) & METRIC DIE SET: 14, 16, 18, 20, 22, 24 m/m
11. UNF OR UNC TAP SET (2 Taps each size) & DIE SET: 0 to 12 UNF or 1-12 UNC
12. UNF OR UNC TAP SET (2 Taps each size) & DIE SET: 1/8, 3/16, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1"
13. UNF OR UNC TAP SET (2 Taps each size) & DIE SET: 1/8, 3/16, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1"
14. GAS (BSP) PIPE SET: 1/8, 1/4, 3/8, 1/2, 5/8, 3/4 (2 Taps each size)
15. METRIC FINE PITCH SETS (10 sizes from 3 - 12 m/m) TAPS & DIES
16. METRIC FINE PITCH SETS (6 sizes from 14 - 24 m/m) TAPS & DIES
17. ENDMILL SET (THREADED SHANK) [1/8, 3/16, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1"] or (m/m) 3, 4, 5, 6, 7, 8, 10, 12 m/m
18. SLOT DRILL SET (THREADED SHANK) [1/8, 3/16, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1"] or (m/m) 3, 4, 5, 6, 7, 8, 10, 12 m/m
19. ENDMILL SET, 3/16, 1/4, 1" DIA. WITH 3/16 THREADED SHANK TO FIT COLLET CHUCK
20. COUNTERBORE SET (FOR SPOTFACING) [1/8, 3/16, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1"] OR (m/m) 3, 4, 5, 6, 8 m/m
21. REAMER SET (STRAIGHT SHANK) [1/16, 1/32, 1/64, 1/128, 1/256, 1/512, 1/1024, 1/2048] or (m/m) 2, 3, 4, 5, 6, 7, 8, 10, 12 m/m
22. DRILLS (LONG SERIES) TO VARIOUS SIZES BETWEEN 1/16 - 1/8 STRAIGHT SHANK
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A3	1/4 x 3/8 - 1/2 - 5/8 - 3/4 - 7/8 - 1.	11.75
A4	5/16 x 1/2 - 3/4 - 1 - 1 1/2.	14.55
A5	3/8 x 1/2 - 3/4 - 1 - 1 1/2. EN8M	15.35
A7	1/2 x 3/4 - 1 - 1 1/4 - 1 1/2.	23.10

B.M.S. ROUNDS

B1	1/8 - 5/32 - 3/16 - 7/32 - 1/4 - 5/16 - 3/8.	05.75
B2	1/4 - 5/16 - 3/8 - 7/16 - 1/2 - 9/16 - 5/8.	10.10
B3	5/8 - 3/4 - 7/8 - 1.	17.35
B5	3/8 - 1/2 - 5/8 - 3/4 - 7/8 - 1 EN8M	22.95

B.M.S. HEXAGONS

C1	3/16 - 1/4 - 5/16 - 3/8	05.75
C2	1/4 - 5/16 - 3/8 - 7/16 - 1/2 - 5/8	10.90

B.M.S. SQUARES

D1	5/32 - 3/16 - 1/4 - 5/16 - 3/8	05.00
D2	7/16 - 1/2 - 5/8 - 3/4	10.90

BRASS ROUNDS

E1	1/8 - 3/16 - 1/4 - 5/16 - 3/8 - 1/2	16.65
E2	1/16 - 3/32 - 5/32 - 7/32 - 9/32 - 7/16 - 9/16 - 5/8	26.50

BRASS SQUARES

F1	1/8 - 3/16 - 1/4 - 5/16 - 3/8	16.00
F2	1/4 - 5/16 - 3/8 - 7/16 - 1/2	29.20

BRASS HEXAGONS

G1	5/32 - 3/16 - 7/32 - 1/4 - 9/32 - 5/16	10.95
G2	1/4 - 9/32 - 5/16 - 3/8 - 7/16 - 1/2 - 5/8	30.50

BRASS ANGLE

H1	1/4 x 1/4 x 1/16	5/16 x 5/16 x 1/18	
	3/8 x 3/8 x 1/16	1/2 x 1/2 x 1/16	11.35
H2	5/16 x 5/16 x 1/16	3/8 x 3/8 x 1/16	
	1/2 x 1/2 x 1/8	3/4 x 3/4 x 1/8	21.15

DRAWN STEEL ANGLE

H3	16mm x 16mm x 3mm,	
	20mm x 20mm x 3mm	25mm x 25mm x 3mm
		13.50

SEAMLESS COPPER TUBE

J1	1/16 x 28g - 3/32 x 28g - 1/8 x 24g - 5/32 x 24g	09.10
J2	3/16 x 22g - 1/4 x 20g - 5/16 x 20g - 3/8 x 22g	11.30

STAINLESS STEEL ROUND 303 F/C

K1	3/32 - 1/8 - 5/32 - 3/16 - 7/32 - 1/4	10.00
K2	3/16 - 7/32 - 1/4 - 5/16 - 3/8 - 7/16 - 1/2	25.90

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L1	.152" - .193" - .220" - .248" - .275" - .312"	15.45
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M1	.152" - .193" - .220" - .248" - .275" - .324"	13.85
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BA STEEL HEXAGONS

M2	.193" - .220" - .248" - .275" - .324"	04.50
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BRASS FLATS

N1	1/16 x 1/4 - 3/8 - 1/2 - 3/4 - 1	08.65
N3	1/8 x 1/4 - 3/8 - 1/2 - 3/4 - 1	20.65

ALUMINIUM ROUND F/C

P1	3/16 - 1/4 - 5/16 - 3/8 - 7/16 - 1/2	13.65
P2	5/8 - 3/4 - 1	23.75

PHOSPHOR BRONZE ROUND

Q1	1/8 - 5/32 - 3/16 - 1/4	12.70
Q2	5/16 - 3/8 - 1/2	32.95

SILVER STEEL

S1	3/32 - 1/8 - 5/32 - 3/16 - 7/32 - 1/4 - 9/32 - 5/16 - 3/8 - 7/16 - 1/2	22.45
S2	3mm - 4mm - 5mm - 6mm - 7mm - 8mm - 9mm - 10mm - 12mm	19.50

ALUMINIUM FLATS

R1	1/8 x 1/2 - 1/8 x 1 - 1/4 x 1/2 - 1/4 x 1 - 1/4 x 1 1/2 - 1/4 x 2	18.90
R2	3/8 x 1/2 - 3/8 x 1 - 3/8 x 1 1/2	15.55

ALUMINIUM FLATS

R3	1/2 x 1 - 1/2 x 1 1/2 - 1/2 x 2	23.75
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OPEN DAYS

Chester UK are pleased to report another successful open weekend, this being the 6th annual.

We would like to take the opportunity to firstly thank all our visitors who came from far and wide across the British Isles. We just hope the frantic rushing around for the many bargains didn't stop you getting a pint on the way home or in the local!

Massive thanks go out to the Mold Model Engineering Society, to Ken and the crew who turned out with their fantastic 31 1/2" and 5" models. This gave our open days a brand new concept which was welcomed by our visitors and we firmly believe we are now turning our open days into a Mini Model Show so many thanks to the guys for giving up their time. Keep up to date with forthcoming events at the club on the News and Events section on our website www.chesteruk.net

Once again, great thanks to Graham Corry and his family and friend Vincent who turned up with engines and scale replica of a Crossley respectively, plenty of steam created, thanks guys! Graham has been bringing his engines since our open days started 6 years ago now and even Jules being in the temporary wheel chair didn't stop the 'Corry' family attending so many thanks and we wish Jules a quick return to full strength.

We would also like to thank Dave Woodall transport for donating their vehicle for the day with the latest technology of offloading facilities. Dave has the latest technology in rear mounted fork lift trucks on his lorry's enabling us to offer a fantastic and highly sophisticated off loading facility to our customers at truly unbeatable prices. Dave Woodall transport specialise in deliveries to Scotland and the South west and can be contacted on 01244 660528.

Another of our main attractions was our own warehouse manager's grass racing car. Ashley's twin Suzuki GSXR 1000 powered Nissan Micra was surrounded for long periods of the day, until he switched on the engines when they were no doubt heard in the Nurburgring in Germany! Again if you check out the News and Events section on our website you will find information about how he gets on this season.

For those who missed out or live too far away in the south, we have a Newflash! Chester UK are pleased to announce we will be holding our first Southern Open Days at our Southern base in London. The event will be held at TPH Machine Tools, Unit 4/5 Blackwater Close, Fairview Industrial Park, Marsh Way, Rainham, Essex, RM13 8UA. This unmissable event will be held on Saturday 1st September 10am-4pm and Sunday 2nd September 10am-4pm. You can contact us here at Chester on our usual contact numbers or via email for further details or alternatively you can contact George Clements at:

TPH Machine tools on 01708 523 916 or through their website at www.tphmachinetools.co.uk watch this space for further details.



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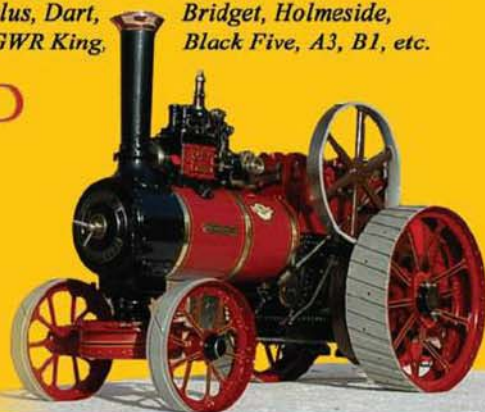
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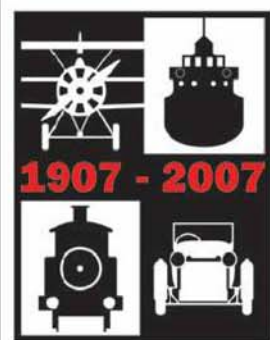
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feed, gearbox and stand



Harrison Graduate wood lathe



Elliot 10M 10" shaper - 240 volts



Milling/Drilling ground X-Y table



Edwards 50" (1.5M) x 16g box
and pan folder



Check out our large range here in Sidcup!

We also have
a massive range of
small tooling for too
much to list!



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DISTANCE NO PROBLEM!

DEFINITELY WORTH A VISIT

ALL PRICES EXCLUSIVE OF VAT

Just A Small Selection Of Our Current Stock Photographed!



Angled



Swivelled

The '626' Turret Milling Machine is the next step up from conventional bench mounted Mill/Drills and has proven to be extremely popular since its introduction. A long 330mm travel on the dovetail knee means there is no requirement to relocate your machine spindle during changes.

626 Turret Mill

SPECIAL OFFER

£1450.00

Features

- ½ 1.5HP Motor
- Metric or Imperial Machines
- MT3 or R8 Spindle Taper
- Head Swivels 90 degrees
- Head Tilts 45 degrees

Standard Accessories

- **X-Axis Powerfeed**
- Machine Work Light
- Central Lubrication System
- Machine Stand
- Table Guard
- Drawbar
- Manual & Parts List



Drilling Capacity	32mm
End Milling Capacity	25mm
Face Milling Capacity	75mm
Table Size	156x745mm
Longitudinal Travel	380mm
Cross Travel	135mm
Max. Dist. Spindle To Column	155mm
Head Tilt	45 deg Left or Right
Knee Travel	330mm

'T' Slot Size	14mm
Number of Spindle Speeds	9
Spindle Speed Range	190-2100rpm
Spindle Stroke	80mm
Spindle Taper	MT3 or R8
Motor	1½hp
Supply	240v or 415v
Dimensions (WxDxH)	1085x990x1710mm
Weight	410kgs

Call For Our New Catalogue

All Prices Include Vat & Delivery*

***UK Mainland only**

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