



# Maidstone Model Engineering Society

President:  
JOS. N. LIVERSAGE  
C. Eng., M. I. Mech. E.

## NEWSLETTER '77

### AUTUMN EDITION

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Our thanks to the many Societies from whom we have received newsletters. They are greatly appreciated.

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Copy for the winter edition must be in by :-

NOVEMBER 12th. LATEST.

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## SECRETARY'S NOTES

Referring briefly to my recent trip to Japan I must first thank the four members who did so much to help me on my way. At the time for engine shipment I had a 'slipped disc' and was only able to crawl about for a few minutes before returning to bed. Martin, Michael, Peter and Stephen did all the heavy work of crating etc. whilst I watched in the fond hope that I would be fit enough to follow later. Fortunately such was the case and on arrival in Tokyo both Nigel and my 4.8.2. were safely waiting.

Apart from my two, Les Nelson from Yorkshire sent a Simplex and a fine 5" L.N.E.R. A.I. three cylinder 2 : I etc. similar to my 4.8.2. Phil Haines of Harrow sent his L.N.E.R. 2.6.0. and his well known 'Barcelona', Phil also sent his 4½" Burrell but did not run his loco's very much being preoccupied with his traction engine. Two other tractor owners, Ray Newman from Bedford and Gordon Howell from Andover also sent traction engines which together with the European contingent plus the Australians and the Japanese there were around thirty loco's all 5" gauge and four traction engines at the nine day convention.

On arrival at the Keio Plaza Hotel ( the tallest in the world ) I was able to see the convention site and the railway which encircled the sky scraper next door and was laid especially for the occasion. We expected a permanent track in a park and were somewhat surprised to find that 7,000 people worked in the building encircled by the two parallel tracks and therefore had to cross the rails to gain entry. This would have an insurmountable obstacle for most people but was no apparent problem for the Japanese.

All the Convention participants were real enthusiasts with some very fine and very large models (my 4.8.2. at 7' 4" was rated quite small) and a total of 53,000 passengers were carried free of charge on the railway alone.

The enthusiasm and hospitality of the Japanese is unbelievable and I have no doubt that they will soon be building tractors and loco's in a big way.

In all we spent just over three weeks as guests of the Japanese, toured much of their country and took lots of slides which I may have the opportunity of showing sometime at the Clubhouse.

Returning to the Secretarial Front I am pleased to say that the Society have at last purchased some useful plant in the shape of oxy - propane equipment for the construction of boilers etc. to be used at Mote Park free of charge to members.

Also the Society has allotted enough capital to start a scheme purchasing bulk materials for re-sale to members. Martin Parham is running the 'Nut and Bolt Scheme' which, if it proves popular, will I hope increase in scope to embrace more variety of materials and be a most useful asset. The Society is also hoping to purchase very shortly an ARC Welder for members use, which will also be useful for repairs alterations etc. on site.

The society, as many will know, enjoys a considerable income from the railway. This income, declared properly to the Inland Revenue and carefully arranged by the Treasurer and our retained accountant means that we pay no tax this year and all the money can be spent on the Society.

This sum is an onerous responsibility for the administration as to what does the Society want for its money?

Regardless of who earns the money on the track it is the clubs and deciding whether to buy new equipment, replace outdated facilities or for whatever purpose is sometimes difficult, therefore I am sure the Committee would appreciate the view of many more members.

Keeping M.M.E.S. money in the bank is pointless and wasteful. In the bank it earns no interest, and even if it did inflation devalues the capital at around 20% per annum, so carrying over hundreds of pounds year to year is throwing hard earned cash down the drain.

The point is this, and I stress this is a personal view based on six years on M.M.E.S. administration and observation of other Societies and my association with the Southern Federation. All societies such as ours must continually struggle forward and not for one moment rest on its laurels. Every succeeding model I make has to be an improvement on the last or one is wasting one's time, similarly a Society composed of people of like mind must go forward also.

Bathing in the reflected glory of a model built years ago is like saying 'our club has better facilities than the one down the road, so let's stop now'. Whilst the complacent Society does this, other clubs are leaping ahead. In the past few years Maidstone has not dragged its feet in this way, but my fear is that it is about to do so. Our Club has a desperate need for younger members 20 - 30 years or so. These are the people that are the future of the Society and we must strive to retain their interest. In my time as Secretary we have joined 63 new members, how many are really keen? How many are on the periphery? and how many never come at all??

When we chopped out the Elm Tree and built the new bays and road-way a great many turned up to help, in my view this was because only four of the sixty-three new members just referred to have a five inch engine and probably feel only half members. When it came to digging or general brainwork on that job we were all equal and an "esprit de corps" existed for that period which has not unfortunately been much in evidence since.

Complacency in a Society such as ours is disastrous, and I have never been completely satisfied with anything I have made - therefore follows the urge to make a better engine next time. Our worthy President will not mind me taking his name in vain as an example. Joe Liversage has made dozens of engines (some of the 9" gaugers would put off a less intrepid modeller for life) and yet with the paint not dry on his 0.6.0 the present Heisler was underway. I don't know how old Joe is, many years older than I, but I feel ashamed to tell him I've only done a third part of my 4 $\frac{1}{2}$ " tractor in a whole year.

Joe should be an inspiration to the rest of us.

M.M.E.S. is a wealthy club situated in one of the finest parks in the country with over 100 members, but many of the younger members will become disenchanted as three recent members of the Committee have done if the Society does not pull its socks up. Some new members perhaps need to see a little more enthusiasm manifest itself and a little less criticism.

M.M.E.S. already possess the best track-side facilities for members that I know of which are available 24 hours a day - 7 days a week. Also there are endless ideal conditions for running traction engines. Don't let's sit back and say if we start another project no one will help or we can't afford it. If we had listened to the pessimists in 1973 we

would still be eating sandwiches in the coalshed instead of iced beer in the clubhouse or Christmas dinner for thirty or so. Similarly we would still be carrying loco's down the embankment instead of driving in to the steaming bays and unloading single handed.

To me there would appear to be two or possibly three areas where interest could be generated and money spent for the general benefit.

The engine shed, now known euphemistically as the white elephant, needs a complete internal refit. Basically the building is O.K. strong, secure, etc., but unfortunately it is not now used and not likely to be for its original purpose. Now that it holds only two or possibly three loco's and not likely to contain more because the new roadway makes it so much easier to take ones engines home. Useful ideas for the future use of the building bearing in mind it must retain a limited section for loco storage will be gratefully recieved.

Due to the ungracious demise of the ticket office the building of a station instead of a sheep pen might be another area for the useful expenditure of money and labour. I know there are such things as vandals, but I don't see when they should dislike a station anymore than the other buildings. The wooden ticket office was battered to death over a long period, had no maintenance and was not fixed down in the first place so a stronger structure should fare somewhat better.

The third venture would be the extension of the track itself. The last extension was fifteen years ago during the worst winter ever recorded with hardly any mechanical aids and borrowed money. I imagine there were many people then who said it was a foolish scheme, but it was done in spite of the appalling conditions.

Our neighbours at Tonbridge extended their track last year by about 800 feet. Starting in the Spring, they finished before Autumn and a great credit it is to all concerned and I AM SURE THEY are very proud and deservedly so.

The problems of the viaduct necessary are not a fraction of the magnitude of Haywards Heath Tunnel and judging by the amount of civil engineers as members that should just add a bit of extra interest.

The Club could well afford to begin such a project as the whole thing could be almost complete before touching the existing track. Permission would have to be obtained of course from the Corporation, but with regard to my many contacts with them in recent years and the good relationship we have always enjoyed I think they would consider such a scheme with favour.

Should the club indulge in such a project some of the 'entent' would be a little more 'cordial' than of late and everyone could get in on the act, and feel that their personal effort was helping to put the M.M.E.S. in its rightful place in the vanguard of model engineering societies.

I am sure the Chairman and Committee would be pleased to know the miews of all interested members between now and Christmas so that possibly everyone could choose where the club is going at the Annual General Meeting.

The remaining repairs to the existing track will continue this winter, though fortunately most material is to hand including the rail. A start will not be made until after Christmas and it is not expected to be too laborious or costly.

Thank you for staying with me to the end of this tirade, but it is my job to report the status of the club each quarter and to try and reflect opinions and criticisms which are quite naturally made to me by members which I in turn refer to the Committee.

Ray Milliken

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EDITORIAL

As I write this the summer programme is almost over with only the Eltham Society remaining to visit us. In general we have been pretty lucky with the weather although our open day was almost completely rained off. However we had better weather than in previous years for the exhibition and a good selection of models were on show. We wish to express our thanks to all organisers exhibitors and helpers.

One of the problems of writing editorials in the past has been the choice of subject, but this time the opposite has been the case, and this is the fourth to be commenced. It wasn't until I read Ray's rough draft that things were finally sorted out.

I would like to comment on some of the points that Ray has made. Firstly I entirely agree that whoever earns the money it belongs to the club and must be used for the general benefit and I am totally opposed to certain proposals that have been made that would limit this to a minority of members. However working members have a valid grievance when they see others appear regularly, do little or nothing and receive the same benefits.

One of the problems new members frequently encounter is that when they try to get involved they are shunned rather by the established ones. On a large project with much work to do it is easier to find employment, but on the more common small scale exercises this is not the case. What I would suggest is that members outside the committee present practical projects which they can both organise and carry out. Unfortunately these small jobs can be rather boring, but they must be done. One item that certainly needs attention fairly soon is the exterior decoration of the clubhouse. This has not been touched since its construction and if not soon tackled deterioration will commence.

When somebody has put forward the 'pros' of a scheme it is difficult to put forward the 'cons' without seeming completely negative. However when considering an extension to the track it brings to mind the last extension (which I remember). After the tremendous amount of work that went into this project in operating the track waned and the club went through a very sticky patch. Rather than stimulating enthusiasm this job overloaded the members and they tended to lose interest. I would hate to see this happen again.

Richard Linkins

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## PET'L'M and BENZ

I am a great believer in counting my blessings, and one of them is the family hill-farm near Inverness, where the acres are broad (if barren) and the air bracing. Naturally, there are farm buildings, and in one of these is a device which someone in the club might be interested in reproducing in miniature. If so, I will take a camera with me when I next go north, and supply pictures. For the time being here is an introduction.

The device is a Tangye horizontal hot-bulb engine of about 1910 vintage. I got the idea that it might interest M.M.E.S. members from the fascination that it exerts on visitors. It used to drive the thrashing machine. What interests me about it is that it bridges the gap between steam and the internal combustion engine as we now know it. Most of the technology is steam (such as the open crank, drip oilers and vast lumps of cast iron), but, on the other hand, it is a recognisable 4-cycle IC engine and there is a bang (or rather a hiss) every now and again to keep the twin flywheels going.

The entire engine is about 5' long. Starting at the business end, there is a combustion chamber with integral surface condenser combined with an automatic inlet valve. On the inlet stroke this valve opens and also admits fuel to the carburettor. Underneath one finds an extremely small (some 2"x 1/2" diameter) hot bulb. Forward of this is a cock, which appears to provide communication between the water jacket and the cylinder head. I can only conclude that this is for stopping in a hurry. The cooling, as already suggested, is water, which is circulated by thermo-syphon from a 100 gallon water butt to generous water passages. The bore and stroke are about 4"x 8", but I would have to measure them to give better figures.

As I have said, there is an open crank of the "wide cylinder" variety, and a massive camshaft driven by gearing which, via a complicated hit-or-miss mechanism with hand over-ride, operates the exhaust valve and does the governing. The flywheels, either side of the crank, are about 2' 6" diameter and have 2" treads.

Sitting on the cylinders are a pair of tanks, one about 1 gallon capacity, and the other about a pint. A fuel pipe leads to the carburettor, via a cock labelled "pet'l'm", "off", "benz". Since turning the cock to "pet'l'm" communicates with the large fuel tank, and "benz" the smaller. I conclude that "pet'l'm" means "paraffin" and "benz" means "petrol". "off" definitely means what it says.

Anyway, I have been too idle to do anything about this engine. Until, that is, my summer holiday when Roy Procter, of the Bracknell society, came to stay with me, and he made up his mind to start it. There was a slight set-back when we found one of the two combustion studs sheared, and in trying to extract it we actually managed to break the local garage's screw extractor. But fencing wire (which does most engineering fixings in the Highlands) and the other stud soon had it reasonably gas-tight. Thus encouraged, we filled the small tank with benz. and, before starting the blow-lamp, armed ourselves with assorted fire-fighting gear. This is because the matchboard ceiling is coming down and is propped up only by the cooling tank. Behind this ceiling is about half a ton of very dry chaff, which is highly combustible.

The original blowlamp, which pointed vertically and was of course pet'l'm powered, has disappeared and used butane. When the bulb was a decent cherry red, we turned on the benz and primed the engine (Roy's idea) by

jiggling the inlet valve. Roy then applied himself to one of the flywheels spokes (no crank-handle is provided) and rotated furiously. When a good deal of momentum had been worked up, we tripped the manual over-ride on the exhaust valve, and, after a couple of false starts, there was a loud hiss, a little burst of flame from the carburettor, a puff of leaking mixture from the combustion chamber, and an appreciable sense of urgency at the flywheel. After that, the governer caused the exhaust valve to stay open for about 20 revs, until the engine had slowed down, whereupon it allowed the valve to close, combustion took place, and the whole process began again. We didn't get round to switching to pet'l'm, but the consumption of benz is not great. Probably most of the fuel consumption is in the blowlamp.

Anyway, I shall now embark on restoration. I said that I would provide information for prospective builders, but, if any one can help me to penetrate the obscure recesses, such as what the water cook to the cylinder is for, and what is the rated horsepower (4, I guess) I should be grateful.

And what about the sheared stud? This is being tackled by the highly anachronistic process of spark erosion.

I am not an old enough model engineer to have heard of efforts to model this kind of thing in the days before we all went loco-mad. But I can foresee problems. The man, for instance, who produces a working pet 'l' m blowlamp in (say) 2" scale gets a bottle of beer, for a start. Any takers??

Lionel Alexander.

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#### ADAPTING A COMPRESSOR FOR YOUR WORKSHOP.

An air compressor can be a very useful accessory in the workshop. Blowing machinery swarf out of components (only while wearing safety specs of course), paint spraying and running your new loco chassis when setting the valves are just a few of the tasks which become possible. The units available on the D.I.Y. market are not altogether suitable for our purposes added to which they are not particularly cheap by the standards of many model engineers. The usual solution is to obtain a unit from a redundant refrigerator and the following notes are to warn you of the dangers and problems laying in wait for the unwary.

Before making arrangements to collect your refrigerator from the donor make sure that it has a compressor in it absorbtion type units (which do not have a compressor) are electrically operated. Having got it home restrain the urge to hack through all the piping in sight until you have read and digested the next section.

#### Safety Aspects

The pipework should contain refrigerant gas under pressure. The reason you were given the unit in the first place might be due to the refrigerant having leaked away, but it is better to play safe and assume that it is there. Some refrigerant gases are very unpleasant substances. Should you get a drop of liquid refrigerant in your eye it could freeze it and cause irreparable damage. Use safety glasses or motor cycle goggles while working to clear out the refrigerant. Always undertake this work in the garden when the wind is not blowing towards the house and under no

circumstances should you smoke. If there are any line stop valves on the unit remove the cap over the operating spindle of each and turn the spindle anti-clockwise to open them. If a valve will not shift it may already be open (backseated) so try it clockwise to check. start to undo a connection and wriggle the pipe, or on hermetic systems put a saw cut into the side of a pipe facing away from you, to allow the refrigerant to escape and then leave it until the pressure has gone. If you get a hint of a choking smell from the refrigerant it may have been Sulphur Dioxide in which case you should drain out the compressor oil while in the open air.

If you are going to dump the cabinet please remove the door or door lock mechanism before you do because a number of small children die each year by being locked in abandoned refrigerators and suffocated.

### Types of Compressor

Refrigeration compressors are of three basic types -- open, semi-hermetic and hermetic.

The open type has the drive shaft passing out of the crankcase through a gland and is driven by a separate motor via V-belts through a pulley cum flywheel. This type is the best for our purposes, but is usually only found on old equipment. If you do not have any data on the running speed required, most of them were designed for a maximum of 600-750 R.P.M. with the occasional one at 1000 R.P.M.

The semi-hermetic has the stator/rotor unit mounted inside the bolted up compressor casing. Sometimes the motor is cooled by the refrigerant gas passing through to the compressor, but on the smaller power units they depend on the fins of the casing to get rid of the motor heat.

Hermetic compressors are the type found in most domestic refrigerators and freezers. The motor and compressor form a basic unit mounted on springs in a pressed steel casing, the two sections of which are welded together. Because no part of the motor is in contact with the casing this type is absolutely dependent on the cool refrigerant gas entering the casing to remove the motor heat. For this reason I would not recommend using such a unit as a workshop air compressor. This also applies to semi-hermetic units which have the suction connection at the motor end of the casing.

The direction of rotation of all types is usually critical. On hermetic and semi-hermetic units this is sorted out at the factory, but should you need to disturb the electrical connections internally check the rotation before and after any work. On open compressors there is no problem providing you are using the original motor. However if you are using another motor look for a direction of rotation arrow somewhere on the compressor casing. If you still cannot sort it out I suggest you bring it to the club so that six people can give you six different opinions on how the lubrication system works!

All refrigeration compressors lose some oil into the discharge. Open type compressors on which the suction air flows through the crankcase and up through the valve in the piston crown are especially prone to this. This oil would spoil paint spraying, but the air receiver will act as an oil separator if the outlet is arranged as high as possible and provision is made for periodically draining the oil. Water will also appear in the receiver as the air leaving the compressor cools. If this does not form an emulsion with the oil watch out for corrosion in the receiver. The oil in the compressor must be regularly topped up (but not overfilled) and I

suggest motor oil using SAE 30 for open and semi-hermetic units and SAE 10W/30 for hermetic types.

When compressing air the unit will require more power for a given swept volume than when on refrigerant. The unit also has to start against a pressure difference so watch out for overheating of the motor.

You will require a number of ancillaries on your installation. A good filter on the compressor suction is an essential to keep down wear. An accurate pressure gauge is also necessary, mounted on the air receiver to prevent damage by pressure pulsations. To control the unit a refrigeration low pressure control (auto reset) can be used wired to start the compressor on a falling pressure and stop it at the predetermined maximum pressure. There should be also an overpressure safety device for your protection. This can either be a refrigeration high pressure cut-out with hand reset or a relief valve as fitted to the club compressed air system. If a relief valve is used it must be able to pass the full compressor output without an excessive rise in pressure above the lifting pressure. Anyone requiring guidance on this point can contact me. Never have a stop valve between the compressor and its safety device. This may be stating the obvious, but always remember that compressed air can be a most useful servant, but a dangerous master.

Barry Lawson.

Footnote

Since writing these notes I discovered that Reg Robinson was in the process of bringing an hermetic type ex-refrigeration compressor into service on air. Perhaps for the next edition of the Newsletter our Editor can twist Reg's arm for an article on his experiences and what success he has had.

B.W.L.

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Don't Blow Your Top.

In my filing system (i.e. in one of the heaps in my bedroom) I have a piece of paper bearing two simple formulae for the calculation of the area of safety valves. Being not too sure of the origin of these I was wary about publication, but I hope that they will be useful to members. The formulae are as follows :-

1. The grate area in square inches divided by three times the gross pressure gives the square of the diameter of the safety valves. (The gross pressure, otherwise known as absolute pressure, is the sum of the indicated gauge pressure and the ruling atmospheric pressure. For the purposes of these calculations the latter may be taken as 15 psi.)
2. The grate area in square feet multiplied by 37.5 and divided by the gross pressure equals the area of the safety valves.

For an engine with a grate area of 22 square inches and a working pressure of 85 psi. the formulae produce the following results :

1. Dia. of each valve =  $\left( \frac{22}{100 \times \frac{1}{3}} \times \frac{1}{2} \right)^{\frac{1}{2}} = 0.192$  inches  
(2 valves)

2. Area of each valve =  $\frac{22}{144} \times 37.5 \times \frac{1}{100} \times \frac{1}{2} = 0.0287$  square inches

As we require the diameter of the valve needed rather than its area this figure is multiplied by 1.273 and its square root taken. The result is 0.191 inches.

The results from the two formulae are only slightly different, as can be seen, but for model engineering purposes the discrepancy is not worth worrying about. I have checked the comparison with other values of grate area and pressure, and the differences are similar. Thus the best one to use is that which makes the calculation easiest.

If anybody knows the origin of these formulae I would be very pleased if they could let me know.

Richard Linkins.

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Message from the President.

How we build and run our locomotives is our own private affair, but how we perform around the property is everyone's affair. If therefore you have some scheme, project or idea that you want implemented, don't just start in on it, but bring it to the attention of the Committee so that it can be considered in the general overview of things. If that body does not see your scheme as a "goer" for any of a number of reasons, please be good enough to accept their ruling or direction and leave it at that. You may not personally agree with the Committee's ruling, but be assured that YOUR Committee is acting in the best interests of ALL. I know this is an age of civil rights, protests, etc., but we are trying to operate as a democratic body and that means, not everyone doing his own thing, but everyone fitting in with the wishes of the majority!

Joe Liversage.

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STOP PRESS.

Sat. 12th. November, 7.30 p.m. - Questions and <sup>ANSWERS</sup> ~~Answers~~ Evening at Mote Park.

The idea of this event is to provide a forum for member's problems. We hope to have a panel of "Experts" available, but anyone is welcome to question or answer. So if you have just thrown your umpteenth attempt in the bin, please come along and ask before taking up stamp collecting.

Sat. 10th. December, 7.30 p.m. - Lecture by Jim Ewins at Mote Park.

Another of Jim's "Engineering Salads". All those members who came last time had an enjoyable and informative evening. So why not forego your weekly helping of "Husky and Starch" and come along.

Mon. 26th. December - Boxing Day run at Mote Park.

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