# Maidstone Model Engineering Society

President:
JOS. N. LIVERSAGE

# NEWSLETTER '76

AUTUMN EDITION

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

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Copy for the Christmass edition must be in by :-

NOVEMBER 28th. LATEST.

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## EDITORIAL

Here we are again, rapidly approaching Christmass, only another two months, with the committee again talking about repairs to the track. The same old thorny subject, To date the most repairing carried out has, to my mind,been,of a rather temporary nature. Mind you, a section round the first curve was relaid last year, but during this longhot summer disasterous things happened such as beams hitherto firmly affixed, being shifted off their fixings through e expansion.

At the October Committee meeting an agreement, in principle, to offer the services of our track for next year's I.M.L.E.C., after a request from the M.E. Before such trials can take place, however, such occurences as 3½"g. engines disappearing between the rails have got to be terminated by thorough going repairs. If you have any good, practical ideas, bearing in mind that our deadline is end of May, I am sure the committee will be pleased to hear them. I hope the Society will,with determination, pull together and ensure that there is plenty of labour available for carrying out these repairs, bearing in mind that a good job this time will make life easier in the future

Without the Natter spot or Secretary's notes (he's doing other things this time) it falls to me to record the death of two persons associated with the Society.

Miv Carr will be remembered by those who knew her at Mote Park, as one of our happy band of "Ladies". Always in the thick of things, helping with the passengers, dispensing teas, the many other things weall take so much for granted. Jack, our most profound condolences,

The second part of my sad tidings concerns our Mr. Shepperd, who, as you will know, has been instrumental in helping the Society with our improved facilities. His understanding, advice, and help will be greatly missed by the Society.

This issue contains (at last) a semi technical article,(it's got numbers in it), by our Hon. Sec.,who after many appeals, was fina finally persuaded to write about his latest piece of handiwork. I never realised a model loco. had so many basic design criteria.

For my part the Christmass Newsletter will be my last venture as Press Officer, for I now find that, for reasons of work and other more personal reasons, I cannot devote the time necessary to produce the kind of standards required. So, if anyone is interested in a very low paid job (nothing actually, not a sausage), it is there to do.

Please note that articles for the Christmass Newsletter are required by November 28th. VERY LATEST.

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## TONBRIDGE TRACK OPENING

Saturday, 14th. August, saw the opening of the extension to the Tonbridge Model Engineering Society's track, at which a small party of our members attended, by kind invitation.

The Tonbridge members had done some fine work in preparation for the event. A marquee covered the area in front of the clubhouse containing refreshments for their guests and a length of portable tra k had been erected adjacent to it for a display of locomotives, consisting of finished and part finished models, built by members of the Tonbridge Society and their visiting guests.

At 3p.m. Mrs. Jean Marwood, Chairman of the Tonbridge and Malling Council arrived, accompanied by two fellow council members. After an introductory speech by Mr. Mills of the Tonbridge Society, Mrs. Marwood said a few words, mentioning the long standing friendship between the Society and the Council, leading up to the newly extended track.

After her speech, Mrs. Marwood was invited to board the inaugural train, hauled by the 5"gauge Schools Class locomotive, "TONBRIDGE", driven by its builder, Mr. Jack Mercer. Passing out of the station and by the steaming bay area, the train broke through a ribbon marking the start of the extension, thus declaring the track open.

The track is aluminium rail laid on pre-cast concrete beams with sleepers cast in, similar to the system used at Mote Park. The rail is fastened with steel staples clamping both sides of the rail at each sleeper, making a very solid construction. The track-work on the extension, which is about 800ft. long, is laid to a very high standard and gives an excellent, smooth, ride. The extra length now brings the total track length to just over ¼ mile long.

After the inaugural run the track was opened for use by the visiting guests. From our club, Fred LaRoche was first on with his 2-6-0, "GOOMBRIDGE"?(as usual! Ed.) soon followed by Charlie Hayward with his "BI""SPRINGBOK".

In all about 100 people attended the event, which, assisted by the perfect weather, was a memorable day.

Martin Parham

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## WINTER PROGRAMME

OCTOBER 23rd. A trip to York Railway Museum has been arranged at short notice on this date. Anyone who has not seen the notice at the Club House and wishes to participate should contact Barry Lawson.

NOVEMBER 20th. A film evening has been arranged at the Club House in the Mote with films from British Rail and some slides. Again anyone wishing to contribute by bringing some of their more interesting slides or films please contact me (Ed.)

DECEMBER 18th. The Christmass Social. Members and Guests are invited to imbibe spiritous beers and liquers, eat heartily, and generally "rave it up" till the wee small hours.

## "FREE ENTERPRISE"

After some persuasion from our News Editor, here is a brief description of my 4.8.2. Duke of York.

My reluctance to write about anything I make is because there are infinitely better engines to be seen on any weekend, but as mine is larger it seems to get more attention. To illustrate this point, last weekend, at ColneyHeath, I saw an 0.6.2. 3½"gauge engine run for the first time; a masterpiece of engineering, compared to my efforts, which attracted attention only from those able to appreciate the finer points and not the physical size.

However, Duke of York's principal dimensions are :- L.O.A. 7' 3", three cylinders, 42mm.x 2¼" stroke, conjugated slide valve gear. Weight, in working order, including tender, approximately 400 lbs.

Having built an 'AJAX' and a 'NIGE. GRESLY', both of which are quite straight forward to construct, and in Nigel's case, a very capable machine, having hauled many thousands of passengers since it was built in 1971, I cast around for a new engine to make and I discussed the project with the family. Must have big wheels, says I. Must have a pressure gauge and water gauge that will not plummet downwards whilest discussing dresses in stations says my wife. Must not throw cinders, hot oil, hot water etc., out of chimney, have knobs which don't burn fingers and be green and bigger than Mr. Rix's 'Liberty' says Daughter.

An L.N.E.R. A3 was chosen though it would not be quite as big as 'Liberty! Armed with a 10ft. length of 6"x3/16 B.M.S. I set to work and marked out an A3. At this time I saw a sketch in Brown's biography of H.M.Gresley, of a giant 4.8.2. rather like an extended A3. Just what I wanted, so, turn over frame steel, make room for another axle, more valve gear and cylinders forward a bit, and Duke of York was born. I tried to keep many features of an A3, correct trailing frames, cartazzi trailing axle etc., the interesting part being the 2:1 valve gear. The crankshaft,built up and Loctited together,the pin angles being 120°, 114°, and 126°, was comparatively simple, having no additional fixings. (A mock-up could not be shifted with 18" stilsons). The centre cylinder,being at 6° to the axis of the outside pair, meant that the inside valve chest had to be machined as a parallelogram with a 2"valve spindle guide and parts milled at 6°to the centre line, to keep it parallel with the outside spindles.

The two to one levers I made twice, the second pair from much larger section steel, because of the considerable flexing which takes place under load. This was discovered by supplying compressed air to the inside cylinder only. The engine would run continuosly, but, in spite of twenty-seven small ball races, some flexing and lost movement could be observed. Though rather difficult to set, the valve events were adjusted satisfactorily, enabling a short cutoff to be obtained in either direction.

The boiler, which is a scaled up version of the A3 type, is rolled up from ⅛"and 5/32 copper sheet,and is 7⅝" over the centre cone, and weighs nearly a hundredweight. A large combustion chamber was arranged to keep the tube length down to 20". 21, ½" tubes are

fitted, and two sets of stainless steel superheaters, in two 1¼"dia. flues. The firebox is 12½" long into the combustion chamber and has a ½"square foundation ring, leaving a grate area of 54sq.in. - 9"x6".

A boiler of this size is quite hard work for one person and requires an enormous amount of heat. A 150,000 btu. propane torch plus a No. 25 oxy-acetalyne torch the ambient in the garage to about 150°F, at which temperature my wife,when called upon to hold one of the torches,developed the inconvenient habit of fainting, which wasted all those BTUs. Eutectic 1800 rod was used, in addition to 300 3/16 copper rivets, to stick the firebox together, as,having a higher silver content than Easy-Flo,it seemed the obvious choice.

When nearly finished, carrying 100bls. of hot copper to and fr fro for pickling is an experience more suited to those of more masochistic tendencies than I. Eventually, left w th a few weeps, effectively stopped with a 300°C paste called TinwWeld, and a test of 200psi. attained, I embarked on the plate work, plumbing, etc. Some of the minor components such as drain cocks, with 17 levers, took a little fiddling, but by and large the worst was over.

A slightly oversize 8 wheel, high sided tender was constructed and the whole ensem'ble given a few coats of green cellulose, with some white lines here and there.

There are no pumps fitted to either engine or tender, total reliance being placed on two injectors for boiler feed.

I am aware that the complete outfit does not resemble any prototype and that it is considerably over scale, but my personal view is that the problems encountered in the design and construction of something somewhat unorthodox, is more interesting as a pastime than an exact copy of someone elses handiwork.

A miniature loco., to me, is an endeavour to create a complete machine from useless hunks of metal,(in my case drain covers and discarded bric a brac) an exercise which keeps me off the streets in winter and takes us out in the fresh air in the summer.

From a practical point, the engine is quite successful and capable of hauling six cars round KotePark with ease, and to the surprise of those with little faith in Loctite, none of the major bits have yet fallen off!.

Finally, to those members about to embark on their first model, my advice as a complete amateur is; 1. one does not need elaborate equipment, my total machine tool cost since 1970, when I started is £47; 2. be sure that you will not be side tracked, stick at it, build as big as you can and ask advice from the "professionals" in the club.

My new project is a 4½" to the foot traction engine, a new field to me and full of promise of new problems.

Ray Milliken

# BALL VALVES

Given some particular size of ball, would you know what size to make the bore or throat upon which the ball seats? Failing this knowledge you would probably wade through back numbers of the model makers journals until this was found, and if you carried on wading you would find the answers varied among the authors and even varies by the same author.

I feel this lack of uniformity reflects some doubts as to the general understanding of the valvesand its function, so I think that the following points may be of interest;-

(1.) Seat Angle.

For general purposes an angle of 45° is the accepted engineering standard for the seat of ball or mushroom valves, except for special applications. Contact area is normally very small compared to the mushroom type.

(2.) Throat or Bore Diameter.

The size of the hole upon which the ball sits. It is bev lled slightly where in contact with the ball to the angle of 45° either by machining; forming by impact by a hardened ball; grinding with a soft ball and an abrasive. For 45° the diameter of the bore is the ball diameter multiplied by the Cosine of the angle;

ie. ball dia. x 0.707

E.G.

$\frac{1}{4}$"dia. ball for 45° seat = 0.25"x 0.707
= 0.176"

A number 16 drill should give this.

The throat diameter for any other seat angle can be obtained by multiplying the ball diameter by the Cosine of the chosen angle. Cosine values are given in most technical hand books.

An easy proof of the foregoing remarks can be shown by the use of a Vee block and any suitable size ball (say a billiard ball). Smear the cheeks of the block with rouge or engineers blue and roll the ball along the vee. This will generate a line on each cheek; measure the distance between the lines with calipers and it will be found that they read exactly 0.707 times the ball diameter. This would,of course, be the correct throat diameter for that size ball and 45° seat.

Whilest the seat angle is sometimes modified to suit special requirements, such as handling abnormal pressures, velocities, viscosities, densities, etc; the standard 45° seat can be considered as a mean value that satisfies the following functions;-

(a) Positive cutoff.
(b) Ball stability. Essential to combat "hydraulic hammering.
(c) Self cleaning and normally even wearing.
(d) Non-sticking. Essential for suction valves where the lifting force is often a minute fraction of the closing force.
(e) Self positioning.
(f) Reasonable pressures between mating surfaces.

Whilst the preceeding notes may not attain great acclamation, I can at least claim to have raised the humble ball valve from the obscurity it so ill deserves.

E.G.Rix.

## CHINGFORD VISIT MAIDSTONE

Saturday, 18th. of September was the occasion of the Chingford & District M.E.C. visit to Hote Park. Our guests arrived with no less than eleven locomotives which created a lot of interest.

Perhaps the most unusual engine was Doug. Houchin's, Garrett 4-8-8-4, B.N.R. (Bengal- Napur Railway) livery, which had steam pipes going everywhere. The heavy full size locos were primarily used as coal haulers and could cope with loads up to 2000 tons. I was amused to hear the 3½"g. version referred to as the "gasworks", partly due no doubt, to the aromatic coal beig burnt.

The 4-4-0 Maid of Kent, No.756, and its builder Percy Woods were first onthe track, and is the loco that came 4th. at the I.M.L.E.C. trials. Featuring inside Joy valve gear and cylinders, it appeared to run effortlessly, in fact we were asked where the gradient on the track was!

Bob Agambar's fine G.W.R., 1500 class 0-6-0 tank engine was present and features valve gear a-la Don Younge, plus radiant superheaters, asuperb model, along with attractive 3½"g. Bantam Cock of Ron Manning.

Two narrow guage engines, those of Alec Laing and Leo May, were present. Both were models of the Tal-y-llyn N°4 engine Edward Thomas, a quaint looking saddle tank engine featuring Hackworth valve gear, indeed faithful replicas of the full size engines. A useful feature is the bunker platework, which has a large hole in it, just right for easy firing on a 5"g. model, and a correct detail.

Also present were Laurie Joyce with his I.M.L.E.C. winner 3½"g. King Edward VIII, Alfred Warren's Butch, the magnificent Brittania belonging to Ron Skuse, Kelvin Moonsey's maroon L.M.S. 2-6-4 tank engine, and last, but not least, the workman like, Canadian National Switcher belonging to Frank Phillips.

We all had a most enjoyable day in the company of our friends from Chingford, the afternoon being rounded off by a lovely tea conjured up by our inimitable ladies, who don't get much pay but do a superb job never-the-less. Thank you all girls.

Stephen Wood

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## SIGHT FEED LUBRICATION

### A BRIEF HISTORY

The G.W.R. adopted displacement lubrication about 1893, when a change was made from tallow to mineral oil as lubricant. They were simple devices, the amount of lubrication being controlled by a needle valve. A development followed with the introduction of a sight glass round the outlet from the needle valve, filled with water which caused the oil to form droplets. These droplets, after breaking away from the nipple, floated up the sight glass to the outle to the cylinders. The amount of oil could then be adjusted visually and more

cont. over

accurately.

The advent of superheating caused decomposition of the oil due to the high temperatures (650°F) encountered. The problem was overcome by using alower superheat temperature (500°F) and mixing wet steam with the oil supply to the cylinders. This worked quite well but, when drifting with the regulator closed, the pumping action of the cylinders caused smokebox gasses and dust to enter the cylinders, drying and contaminating the moving parts causing wear. The answer came with the fitting of a combining valve, fixed below the regulator gland, operated by a link,connected to a pivoted cam, above the regulator. The regulator had a small upward extension with a pin engaged in the slot in the cam. As the regulator was opened the cam lifted the link, so opening the combining valve, admitting oil and steam to the cylinders. When drifting, the regul regulator would be in a position where main steam was shut off but the combining valve still open, allowing oil to reach the cylinders.

PRACTICAL APPLICATION TO"TORQUAY MANOR" (see opposite drawing)

Following the diagram, we start at the oil reservoir, which is at boiler pressure direct from the boiler header. The steam condenses forming water in the bottom of the oil tank, forcing the oil to rise through the non return valve to the needle valve, which controls the flow rate, thence to the sight glass.

The sight glass is filled with water. The oil will only show when the regulator is open, and steam is passing to the cylinders. The rate of oil flow should be approx. 1 globule every ½ min. but this may vary with a different engine. T

The regulator, which should open fully with only 80° movement, lifts the slotted quadrant,opening the jockey atomising valve as the steam flows to the cylinders. This valve is a combining valve for the oil and the auxiliary steam supply,and is arranged to open and close simultaneously with the regulator, and from the outlet the steam/oil mix passes through a hollow stay, being further atomised, to the superheater outlet header,where it is mixed with the main steam supply to the cylinders.

This system works very well and so far has lubricated the cylinders satisfactorily, without any large globules of oil being thrown from the chimney. The flow of oil can be regulated from the cab so that,near the end of a days running, the oil is increased to give extra protection to the cast iron cylinders etc. while the engine is standing.

So far this method has proved to be a very reliable way of lubricating a model locomotive, the oil consumption being quite low.

"Oil in small doses" by F.Cotton, Oct.20th. & Nov. 3rd. 1967, in the M.E.,will tell you all about it.

F.R.Wilkinson.

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INFLATION?

"Can I help you Sir?"

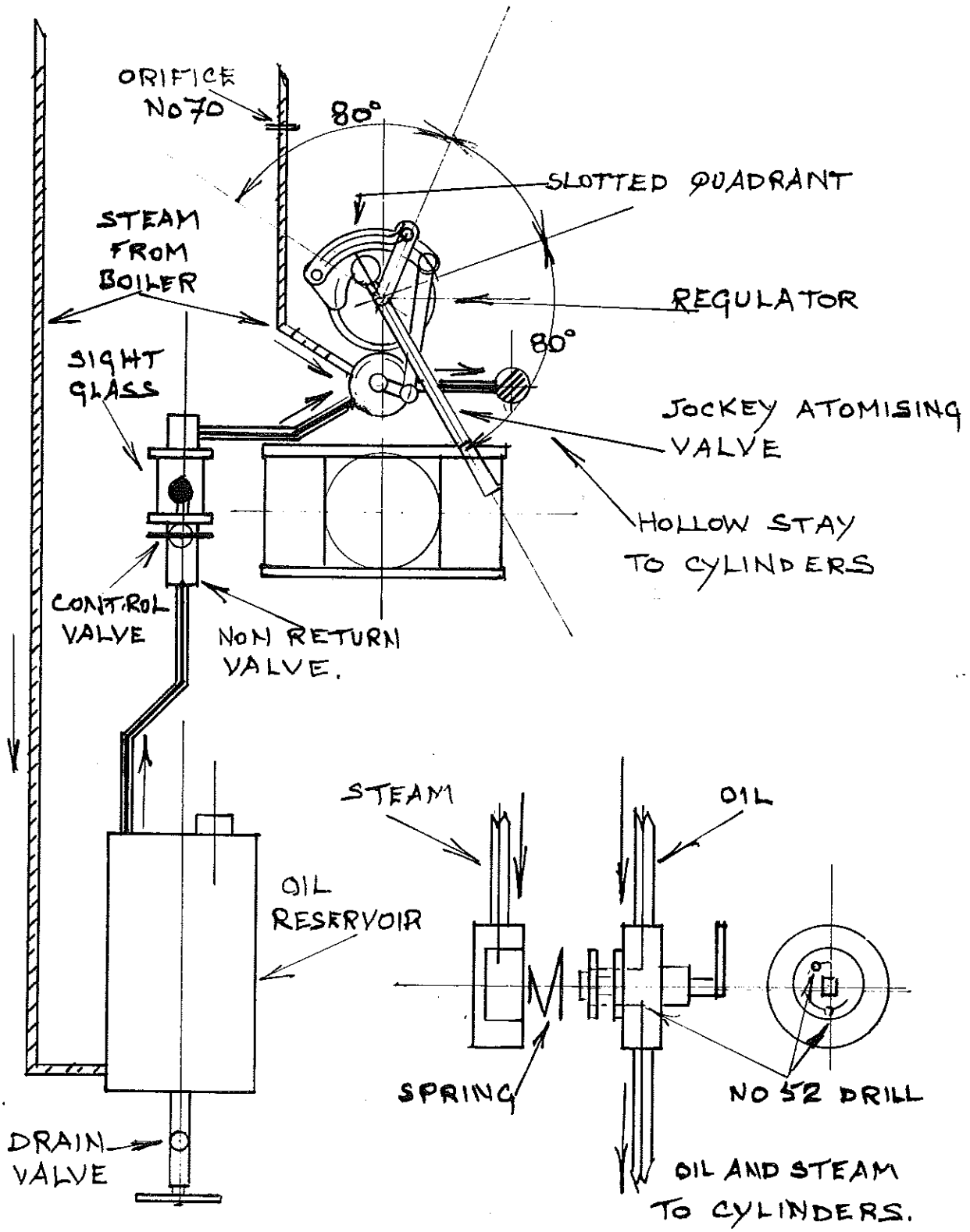
"Yes"I said, putting down a Fiver on the counter,"I have called to pay my bill".

"Thankyou Sir, here is your change. I fear itis not very much, but it does bear the same proportion to the bill, as the bill does to the Fiver".

I found little tomfort in his remarks, which prompted me to count the change; it was right. Incidently what change did I get?

(There is no catch or funny stuff in this; Answer to nearest 1p. will do.)

E.C.Rix.




JOCKEY ATOMISING VALVE

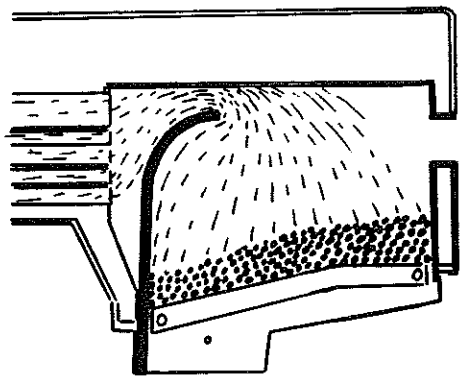
# SIGHT-FEED LUBRICATION.

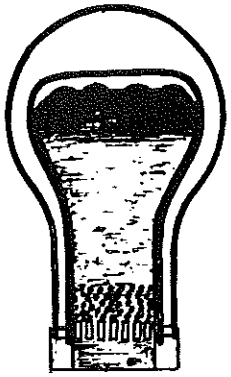
F.R.W.
1.6.76

# PROTECTING TUBES

I thought I was having more than my share of teething troubles when I first built my B.1. and one Sunday whilst waiting in the station to be loaded with passengers," or for the next bit to fall off", I overheard someone say that the name 'UNICORN' was Greek Mythology for the God of Evil. I thought that fits, so from then on thats what we called it. It seemed to settle down after that, for the next three years anyway, and then the tubes burned out. Which brings me to the point of writing this.

Having got it all to bits and the boiler on the bench, I found that the tubes at the smoke box end were as good as new, but at the fire box were as thin as paper. I gathered that much of this was caused by a sand blasting effect they must be subjected to at that point when the engine was working hard. Having had experience with refractory concrete, I ruled out the possibility of using such small pieces in a 5" fire box, but thought I must protect the new tubes somehow, so I finished up by making a piece of 3/16" stainless steel sheet the same shape as the back tube plate, bent backward at the top so leaving a gap of about 3/4" inch from the fire box crown. Everything must now go over the top of this plate, that I call a Baffle Plate, so the big hard bits of fire that I recon do the damage, stay put and get burned before going through the tubes.





BAFFLE PLATE AS ON UNICORN.

The Plate goes in sideways before being turned, and then is held in position by the ashpan and the front of the firebars. The first one lasted three years, the present one has been in two, and my tubes still look as good as ever, both ends.

This plate also throws some of the heat to the back of the fire box, the same as the brick arches did on the 'biguns'. This means that more often than not I leave the door open going up the bank on the Mote Track to stop the valves from lifting, but I prefer that to altering the blast pipe. I can always make steam quick if I have to.

I shall use the same idea on my new engine a "BR Standard Class 5" cos' my Grandson who keeps his thoughts to himself at the moment, won t like retubing boilers any more than I do.

Charlie Hayward.