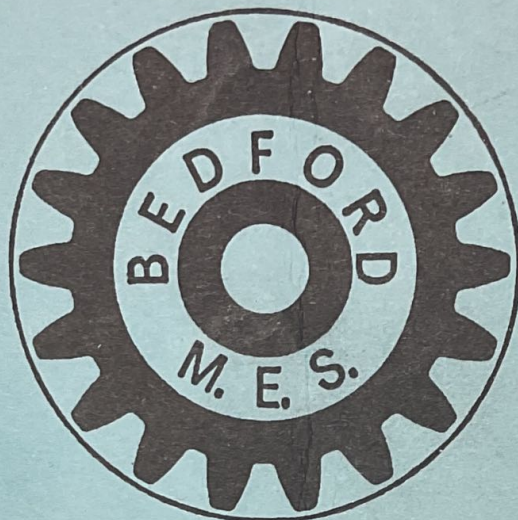


BEDFORD MODEL ENGINEERING SOCIETY



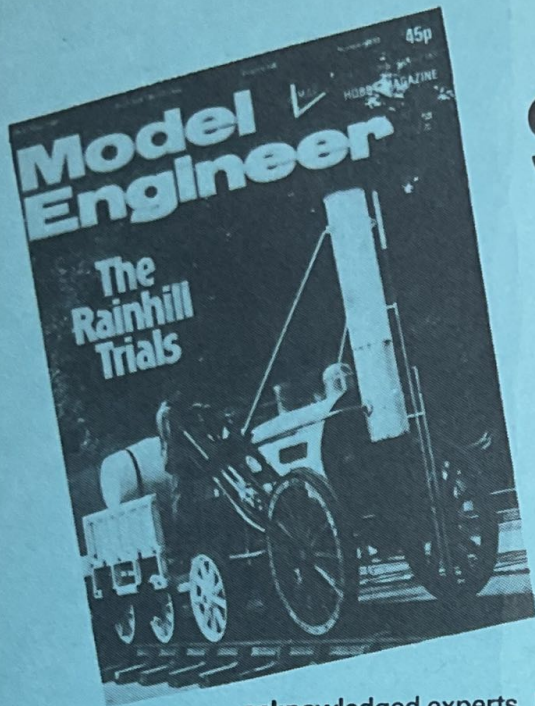
**12th
INTERNATIONAL
MODEL LOCOMOTIVE
EFFICIENCY
COMPETITION
1980**

Sunday, 31st August, 1980

**Rear of 'The Rose' Public House,
Cotton End Road, Wilstead, Bedford.**

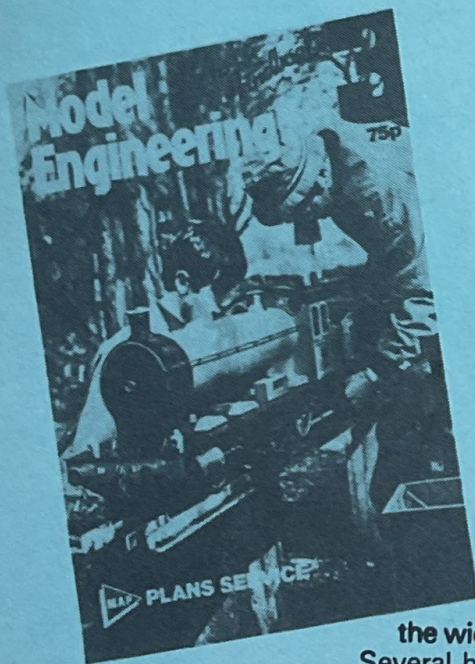
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I.M.L.E.C. 1980

To-day's competition is the 12th in the series sponsored by the "Model Engineer".

Sixteen coal-fired locomotives are competing and each will run for half an hour. A dynamometer car will log distance travelled and total work done. Water and weighed quantities of coal will be available to the driver throughout his run. The readings from the dynamometer and the weight of coal burnt will be used to calculate the loco's efficiency.

The track is 996 feet in circumference and has four varying radius curves in its circuit.

Out of the station and under the footbridge is level to the first curve, then there is a long down gradient to the second curve, to the shortest length of straight track behind the embankment, you then enter Deans Folly tunnel on a curve and leave it on a curve for the up hill climb past the test siding and steaming bays back to the station to complete the circuit.

A progress board on the verandah will be kept up to date by the Bedford M.E.S. Judges which will give the result of each run shortly after its completion.

In the interests of safety a 12 m.p.h. speed limit is imposed.

We, in the Bedford M.E.S., sincerely hope that all competitors, spectators and trade stand personnel have an enjoyable and interesting day.

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Calculation of Results

(Reproduced by courtesy of the Bristol Society of Model & Experimental Engineers)

(NOTE. Parameters marked * are shown on Results Board)

The dynamometer car measures and gives a direct reading of Total Work Done* in foot pounds and Total Distance Travelled* in feet. In addition the Overall Run Time* (minutes) and Weight of Coal Used* (pounds) are recorded.

From these parameters the following calculations can be made:-

Average Draw Bar Horse Power =

$$\frac{\text{Total Work Done (ft. lb.)}}{\text{Overall Run Time (mins.)} \times 33,000} \text{ h.p.*} \dots\dots\dots(1)$$

Coal Consumption Rate =

$$\frac{\text{Weight of Coal Used (lb.)} \times 60}{\text{Overall Run Time (mins.)}} \text{ lb./hr.} \dots\dots\dots(2)$$

Specific Fuel Consumption (S.F.C.) =

$$\frac{\text{Coal Consumption Rate}}{\text{Average Draw Bar Horse Power}} \dots\dots\dots(3)$$

Substituting (1) and (2) in (3)

$$\text{S.F.C.} = \frac{\text{Weight of Coal Used (lb.)} \times 1,980,000}{\text{Total Work Done (ft. lb.)}} \text{ lb./D.B.H.P. hr.*} \dots\dots\dots(4)$$

Now, Overall Thermal Efficiency =

$$\frac{\text{Work Output} \times 100\%}{\text{Heat Input}}$$

Assuming the calorific yield of the coal to be 14,000 B.Th.U/lb., 1 lb. of coal will yield 14000 x 778 ft. lb. of heat where 778 is the number of ft. lb. per B.Th.U.

From (4)

$$\text{Overall Thermal Efficiency*} = \frac{1,980,000 \times 100}{\text{S.F.C.} \times 14,000 \times 778} \% \dots\dots\dots(5)$$

$$= \frac{18.1785}{\text{S.F.C.}} \% \dots\dots\dots(6)$$

The locomotive which returns the highest Overall Thermal Efficiency is the winner.

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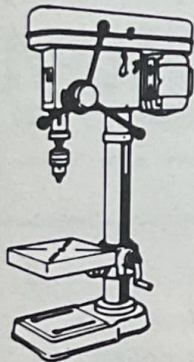
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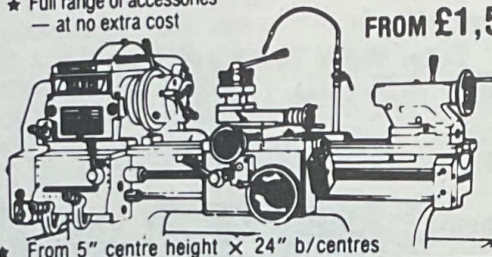
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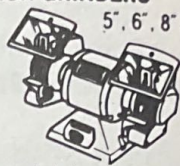
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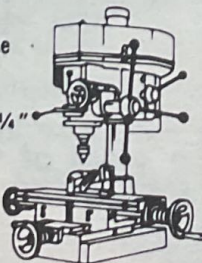


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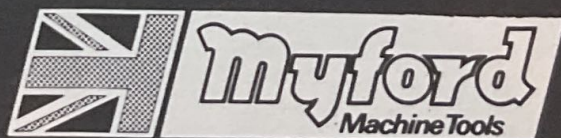
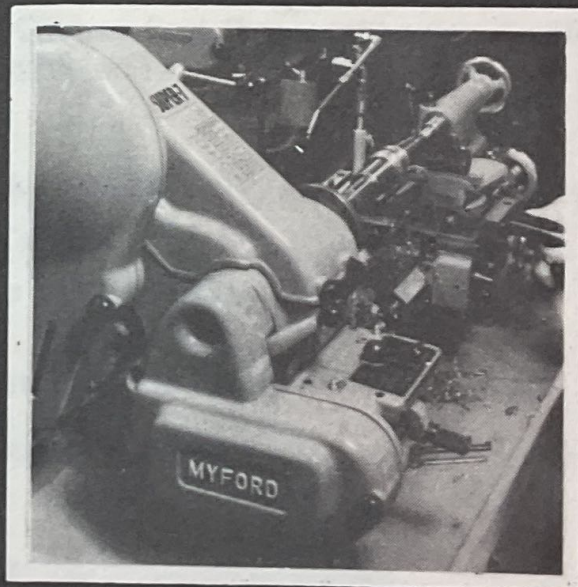


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All enquiries should be made through the current Secretary who at the present time is:—

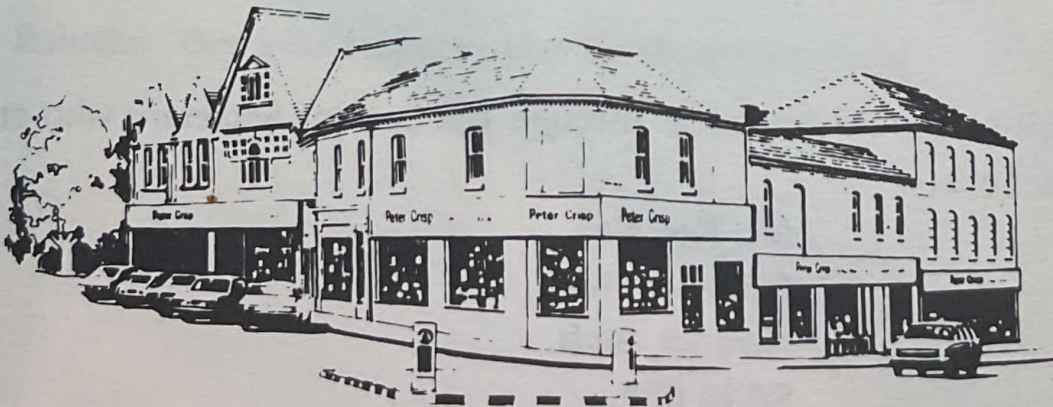
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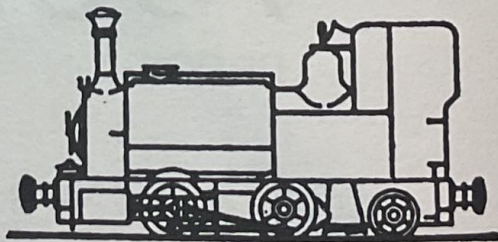
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