LOCOMOTIVE SHED LAY-OUT.

Discussion in Manchester on Paper No. 156 (see JOURNAL, *Vol. XIV., No. 63, page 147).*

DISCUSSION.

The Chairman (Mr. J. W. Smith): I feel sure you will all agree that Mr. Attock has dealt with his subject in a most exhaustive and clear manner. He has gone through all the steps necessary for the preparation and stabling of engines in running sheds. He has given a great amount of information on which some of you will like to ask questions, and I am sure that Mr. Attock will be pleased to answer any questions and give further information on any point which is not clear. The details of running shed work which he has gone into are very interesting, and, as he says at the end of the Paper, the field of running shed work affords great scope for making enconomies.

Mr. W. Paterson (L.M. & S.R., Manchester): Comparing the "turntable" type of shed shown in Fig. 1 with the closed-end rectangular type, it is apparent that there is a considerable area outside the circumferences of the circles (within which are the turntables and radiating roads) and inside the four walls which could be utilised to accommodate machine tools, repair staff, stores, etc. As all these must be outside the area representing the straight shed (Fig. 1), it follows that the difference in the areas of the two sheds is not actually so great as the diagram indicates.

I am entirely in agreement with the Author when he stipulates that the maximum length of straight sheds with one end closed should approximate to that shown in

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Fig. 1, but the greater accessibility secured by the open-ended or through shed must result in more economical working.

Those who have had long experience of the round-house or turntable type of shed appear to be agreed that the risk of detention through turntable defects is infinitesimal, and in my opinion the shed of this type shown in Fig. 1 represents the best arrangement, as it ensures freedom of selection, facility of access to individual engines, easy control of smoke nuisance, reduction of employees' unproductive time, and of engine standing time.

In connection with the chart of shed yard movements (Fig. 6), there is one factor which should be mentioned as contributing to the delays, viz., the necessity for the proper marshalling of engines before being stabled in a dead-end straight shed.

Frequently engines are held back, awaiting the disposal of other engines booked out at a later period. This is practised with the object of avoiding engine-shunting from one road to another after stabling.

I would suggest that a shed yard lay-out based on a semi-circular plan, or alternatively on a triangular plan, with the shed in each case centrally located, would overcome many of the difficulties common to existing lay-outs, and perhaps the Author would be good enough to comment on this, and also to say whether he considers feasible the suggestion that, instead of the present system of coal storage at individual sheds, there should be (in those areas where a comparatively large number of sheds belonging to one railway are situated within a fifty-mile radius) one central coal storage yard equipped with mechanical coal-lifting and dumping appliances.

From this central storage ground, emergency supplies could be issued as demanded. This arrangement seems to promise greater economy in wages and of floor space than the present system of storage of coal at each depot.

Mr. Sheridan (Visitor): Many running sheds appear to have been built in a limited ground area. As to what this limitation is due to it is hard to say, but the fact remains that few sheds to-day give adequate facilities for the efficient working of a twentieth century railway.

I am of the opinion that it is "too late" to try and increase shed accommodation at terminal stations, owing to the prohibitive price of land. Serious consideration might be given to building further out in the country, more particularly at a junction adjacent to two or three terminal

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stations. A typical example of what I mean is Kirkham North Junction, where three lines radiate to the terminals at Blackpool Central, Talbot Road, and Fleetwood. At each of these terminals there is a shed, and the three would not be an over big depot if combined in one. As one shed, the saving in the whole of the shed staff would be, approximately, 50 per cent., not including the repair staff, as the reduction in latter may not prove to be more than, say, 20 per cent. This permanent saving would, roughly, set off the additional light mileage caused, and would give more efficient supervision, to say nothing of the areas of valuable land that would be liberated at the terminals. Furthermore, light mileage could be considerably reduced by a system of changing engines at Kirkham, which could be carried out during station time by the introduction of "engine switch necks" similar to those in use at the Liverpool Street Station, London.

The Author has made a very liberal allowance in the allocation of engines to the shed stated in his Paper. When we take the figure of ninety engines for sixty in traffic, I, personally, would like to have such a margin in actual practice.

Of the different types of shed there is much to be said for and against, but the Author has certainly pointed out a very great weakness in the round type in the possibility of the turntable breaking down, and I have had a practical experience of such a thing happening. Again, the larger area required for a round shed condemns it from a cost point of view, unless it be built where land is cheap.

In the procedure of operation after entering the shed, as stated by the Author, I would prefer No. 3 first, as enginemen invariably turn their own engines before bringing them on to the inspection pits.

In the suggested shed lay-out, there is no provision made for drying sand. If the lighting of the engine fires is intended to be done from a sand furnace fire, it should be put in a convenient position for "starting" engines. If, however, firelighters are to be used, it should be placed near the front of the shed to ensure convenience in carrying the sand to the engines.

The wheel drop, as shown in No. 1 road, leaves no provision for the storing or disposing of wheels, and while agreeing with the position of the wheel drop, the road should be extended through the end wall of the shed. This road could then be run on to a small turntable with radiating storage lines. This would mean a slight re-arrangement of the shops.

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The position of the turntable seems to cramp the roads from the shed, and I would prefer to see it at the other end of the coal stage, where the 3,000-ton coal stack is shown. By reversing the position of the coal stage and inspection pits, an engine then coming to the shed would run on the turntable *via* "inlet loop," turn, inspection pits, coaling, then into shed. This arrangement reduces the movements to a minimum.

Mr. F. G. Moore (L.M. & S.R., Accrington): With regard to the wheel drop and hydraulic lifts, in many sheds one finds both of these on one road. This is distinctly a disadvantage unless some provision for the removal of wheels from one road to the other is provided between the hydraulic lift and the wheel drop; even then unnecessary handling of wheels takes place. A further disadvantage is experienced by having the wheel drop on No. 1 road nearest to the workshops, where the greater part of the traffic in the sheds takes place. There is not sufficient room for the temporary storage of axleboxes, springs, etc., between the running rails and the shed wall. The space is further restricted by the operating handles and the movable wooden cover sheltering the leaves of the wheel drop. If a separate shed cannot be provided, the better position is for the wheel drop to be on No. 2 road and the lift on No. 1 road.

For the storage of oil, heavy material, etc., suitable lean-to sheds should be provided; at present, the heavy stores, brake blocks, skewbacks, fireclay, etc., are usually to be found stored in the shed alongside the walls. This is not only inconvenient but considerably restricts the available walking space.

I hardly agree with the Author as to the position of the offices. I do not consider that the system of building the offices as an integral part of the shed is altogether good. Offices so placed cannot be kept as clean as one would wish, and at times the noise is distracting. Again, it is not desirable that applicants for work or other outsiders should have to cross the whole of the running lines before arriving at the office. The ideal position is near to the entrance gates, facing the main line and overlooking the shed premises and yard.

Mr. J. P. Hamer: At a terminal station the dead-end straight shed is probably the best. At an intermediate station which is working a number of booked trains and specials going in opposite directions, probably short of power, the engines in the straight shed cannot always put in heading the way they eventually work. The round shed seems to meet this problem with greater ease of working,

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At Inverness there is a shed of the round turntable type, but instead of the shed roof covering the table over, it forms an arc; and with every engine entering the shed a set of doors close it in. I think this type of shed is certainly worth considering, as it has not the roof area per engine that the round shed demands, yet it is virtually a round shed.

In regard to the wheel drop and machine shop shown in the diagram, I think that the machine shop is in its right place, as many times the wheels do not require taking outside but go into the machine shop.

Mr. F. W. Slade (L.M. & S.R., Manchester): The Author has mentioned three types of shed lay-outs, and there seems so much to be said "for and against" each that there is little to choose between them.

The "interior turntable" type has its advantages; it gives good facilities for shedding engines, plenty of room to look around, good light and a clear atmosphere; against these, however, is the possibility of the turntable failing, with its subsequent delays.

The "dead-end" and "through-parallel" types do not lend themselves so well to the "freedom of movement" so essential to successful shed operations, and no matter how well designed the lay-outs may be, unless considerable thought is given to the stabling of engines, a certain amount of shunting is inevitable. It is essential, therefore, that the person responsible for shedding the engines should have full particulars of engines required for lifting, periodical examinations, washing out, etc., and also the trains which the engines are booked to work.

To my mind, the most suitable shed lay-out, especially for intermediate districts, where space is available, would be to compromise between the "dead-end" and the "through-parallel" types, and place the covered shed about the centre of a triangle. The "dead-end" portion should take up, say, four roads to accommodate the wheel drop, engines for periodical examinations and heavy repairs, the remaining or "through-road" portion being available for ordinary repairs and stabling.

This lay-out would dispense with a turntable and give alternative outlets, and engines could be placed in the shed irrespective of the order in which they have to leave.

In my opinion, wash-out hydrants should be fitted between each road in the shed so that boilers may be washed out, run off and filled up on any road on which the engines may be stabled. I should like the Author's opinion with regard to the use of hot water for washing out boilers; this considerably reduces the time occupied in running off and

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drop, and also delay being caused to their work by having

Most sheds are primitive and crude in their arrangements for the disposal of ashes. Generally, the road which receives the ashes is on the ground level and there is no doubt that the arrangement of a pit where the top of the wagon is nearly level with the surface is an improvement on the first-mentioned arrangement, as in the absence of wagons the ashes could be dropped between the ash wagon road and the engine on to suitable plates, and later easily thrown into a wagon. Of course, if the wagons are there, the ashes could be thrown into them at first hand. In Belgium, at some of the sheds, the ashes are thrown on to a screen, and from there drop down on to an endless band which takes them forward to a dredging arrangement, which latter discharges the ashes into hopper wagons. It seems to me that the question of the disposal of ashes is very important, and one which leaves room for considerable improvement.

I wish to propose the best thanks of this Meeting be given to the Author, not only for his excellent Paper, but for the very interesting discussion arising out of it.

The Author: I thank you for the attention you have given to this Paper. I am indeed pleased that it has proved of interest and has induced so many to take part in the discussion and contribute the benefit of their experience.

I think the Chairman has correctly summarised the discussion in stating that, so far as the type of shed is concerned, the predominating feeling is in favour of the interior turntable design. This is an interesting and useful indication of the present feeling on a controversial issue.

The Chairman also referred to the question of the disposal of ashes; this is certainly a very difficult problem, and nothing contributes more to the wear and tear of conveying plant than wet clinker and ashes. It appears to me the best method is to throw the ashes on to paved ground and to shovel them therefrom into wagons standing on a lower level.

A number of speakers have referred to the hot-water boiler-washing process, the position of the sand furnace, and the proportion of engines allocated to engines turned out. These points were also raised in the discussion of the Paper at the meeting held in London,* and it is perhaps unnecessary for me to make any further reply.

Mr. Paterson refers to the provision of coal stacks at individual sheds and advocates a central storage. This is a suggestion which might be developed in favourable cir-

* See Journal Vol. XIV., No. 63, p. 162.

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It means late starts, slipshod repairs, engines turned out