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SOUTHERN RAILWAY

JULY



1954

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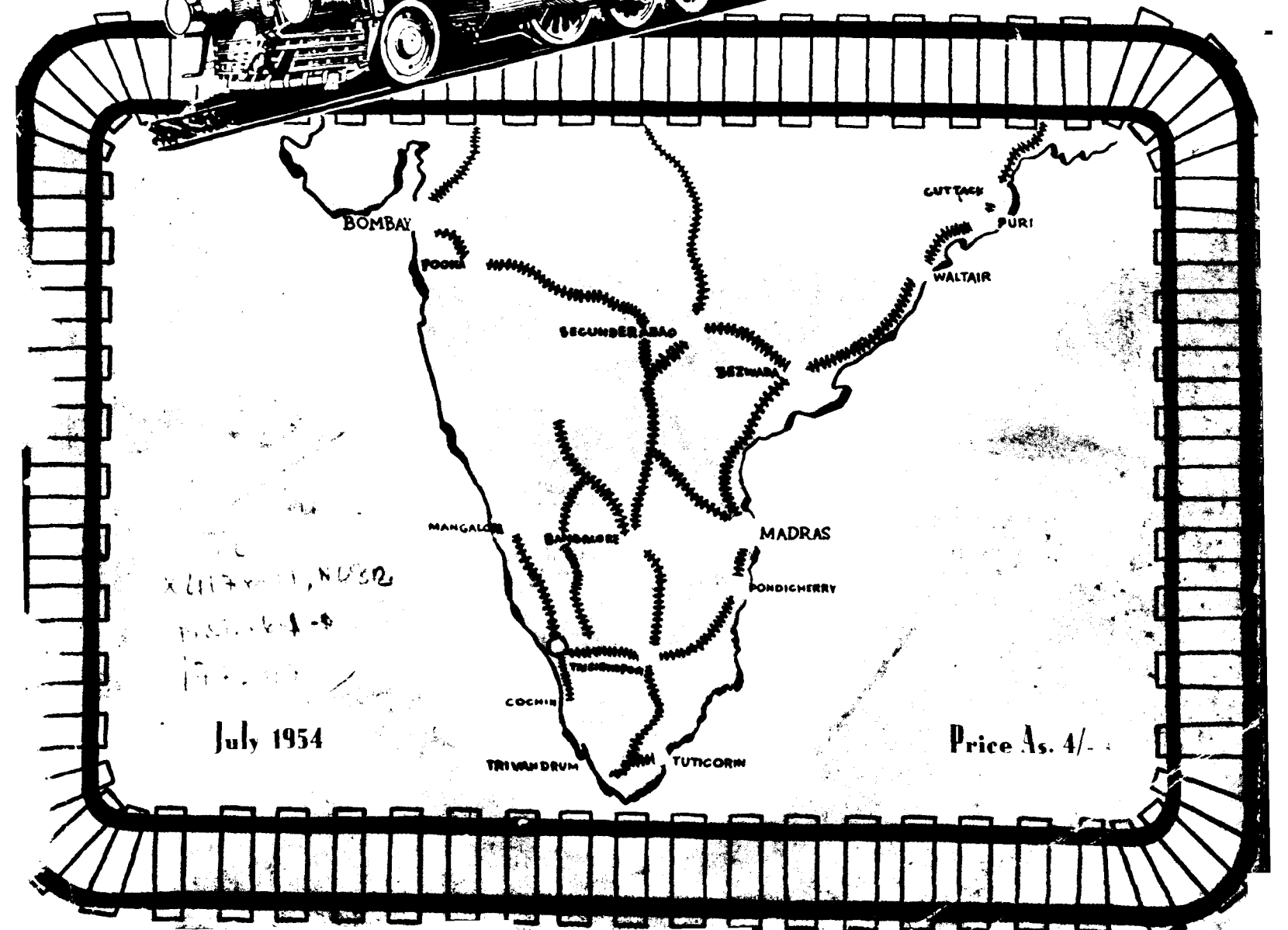
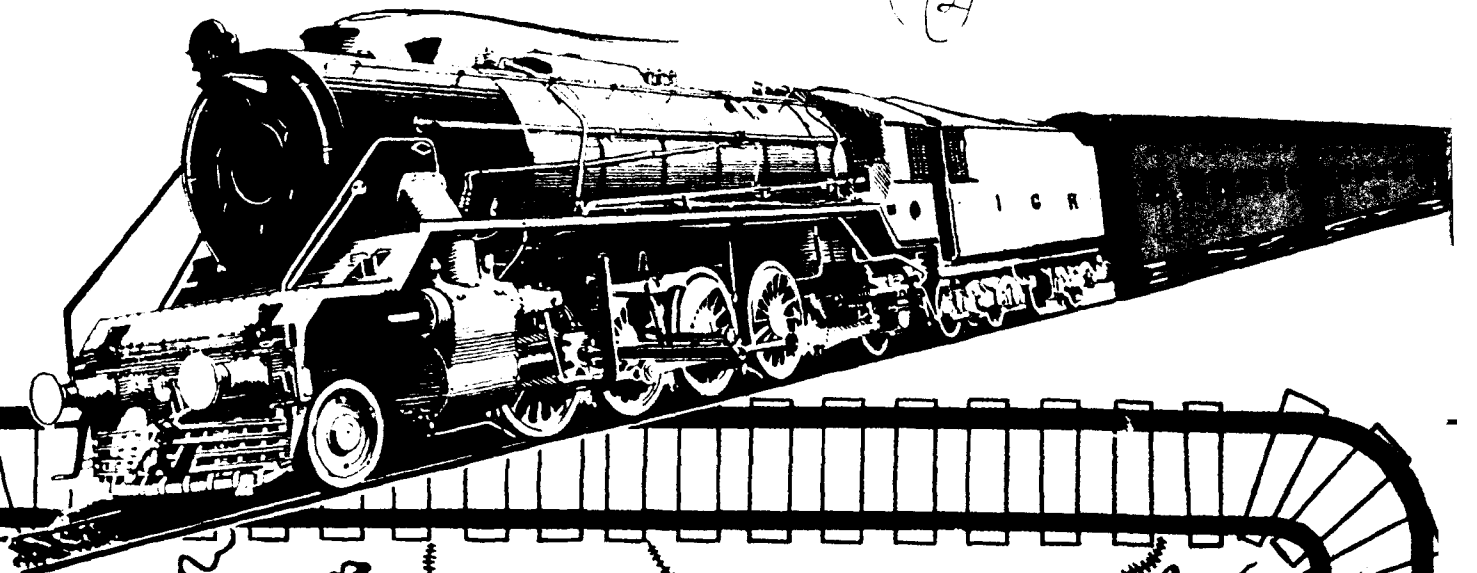
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SOUTHERN RAILWAYS

Magazine

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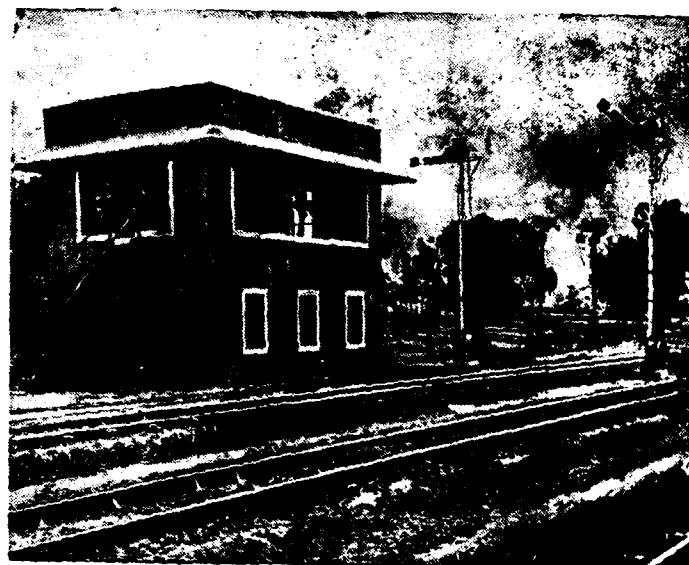


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Editorial Notice

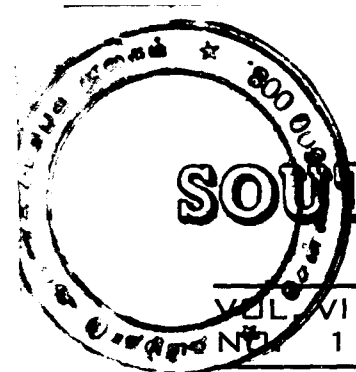
The Editor invites contributions to the Magazine on a variety of topics—short stories, technical features written in simple English understandable to the laymen, Aspects of Railway Working, places of tourist interest, News from home line, activities on Railway Institutes etc. All copy should be brief and typed as far as possible.

Photographs illustrating social functions, sports events, scenic spots etc. are also invited. All contributions should reach the Editor not later than 5th of each month. Rejected Mss. will be returned provided sufficient stamps for postage are enclosed. No responsibility will be borne for copy lost in transit.

Views expressed in this Magazine should not be taken as having official authority.

All correspondence should be addressed to The Editor, "Southern Railways Magazine," Post Box No. 17. Tanjore, (South India).

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SOUTHERN RAILWAYS MAGAZINE

JULY

ISSUED
MONTHLY

“Railway Workshops’ Capacity”

ONE of the objectives of the Railway Ministry is the self-sufficiency of Railways, especially in respect of the Manufacture of locomotives and rolling stock. And the hope has been expressed that this self-sufficiency will be achieved within the period of the first, if not the second Five-Year Plan. If this expectation is realised even by the end of the second Five-Year Plan, Indian Railways should be in a position to provide for all the additions and replacements of rolling stock needed, without having to depend on imports from countries, both in the East and the West, who are at present in a more advanced stage of industrialisation.

Before, however, Indian Railways can expect to reach the high degree of self-sufficiency which is the objective, their locomotive and carriage and wagon workshops, will have to be brought up to the advanced standard necessary in all aspects men, material both raw and processed, machines and machine tools, technical skill, and the capacity to maintain an output that must be far greater than existing at present.

With this objective in view, the Railway Ministry announced last month that a committee had been set up to review the capacity of Railway workshops, examine the possibility of increasing their output, and recommend which new ranges of manufacture should be introduced to provide for the manufacture of components which would otherwise have to be imported and which indigenous manufacturers are not likely to produce at present.

Among other things, this Committee will also examine the possibility of introducing the manufacture of complete items of rolling stock which are at present imported, such as narrow-gauge coaches and wagons. The Committee will review the requirements of machinery and plant for railway workshops and recommend the machines of each type to be standardised for future purchases. It will also examine and recommend the changes in specifications necessary for machines used in railway workshops so that these can be manufactured by the indigenous machine tool industry. The rationalisation schemes in workshops will also be reviewed by the Committee to bring them up-to-date and increase output.

The Committee is also required to examine the possibility of setting up reconditioning centres for wagons, and if necessary for locomotives, in some of the existing railway workshops. The existing capacity for the construction of coaching vehicles will also be examined by the

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Committee, with a view to suggesting what steps should be taken to provide for additional capacity to fulfil the requirements of coaching vehicles and underframes for the next seven years. It will also recommend the action to be taken for a more intensive and efficient use, and the expansion of existing facilities for the overhauling of rolling stock in view of the increased holdings of rolling stock on railways in relation to the existing and planned capacity for such overhaul.

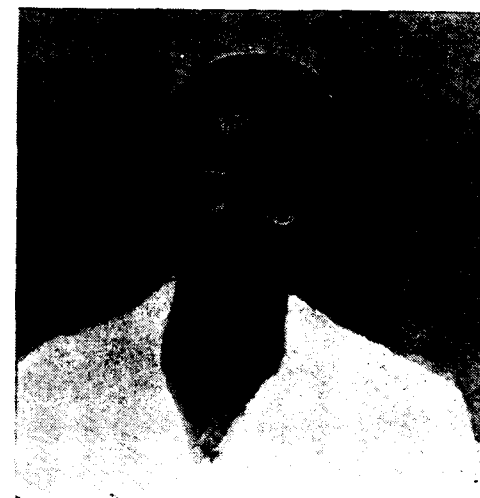
Indian Railways are by no means lacking in large and well-equipped workshops both for locomotives and rolling stock. There are large workshops at Jamalpur, Khargpur, Lillooah and Kanchrapara on the Eastern Railway, Parel on the Central, Matunga on the Western, Golden Rock and Perambur on the Southern, Lucknow on the Northern, and smaller workshops at Dibrugarh on the North-Eastern, and Ajmer on the Western Railway. These workshops are at present equipped for both heavy and light repairs and overhauling of locomotive and rolling stock, and are also manufacturing a large and increasing number of components required to keep locomotive, carriages and wagons in good running condition. Apart from these railway workshops, the Locomotive Works at Chittaranjan in West Bengal, has been planned, built, equipped and gone into production for the complete manufacture of locomotives to be used on Indian Railways. Similarly, the Integral Coach Factory at Perambur in South India, has been built for the manufacture ultimately of the coaching stock needed by Indian Railways.

India has practically all she needs of raw materials for the indigenous manufacture of locomotives, carriages and wagons, and the requisite components. She also has a number of large and well-established railway workshops, and enough human material to man these workshops. Her greatest need at present is machine tools and precision instruments and the machines required to manufacture these indigenously. Another need is highly-skilled technicians.

The Railway Ministry's move to set up a Committee to investigate fairly exhaustively the capacity of existing Railway Workshops with the objective of expansion and increased production leading to a greater degree of self-sufficiency, is opportune. India is making rapid strides in industrialisation, and her Railways, which has been considered her greatest and perhaps most efficient asset, cannot be allowed to lag behind. The Railways will obviously play one of the major roles in helping to achieve the increasing degree of industrialisation planned, as it will be the Railways which will be utilised for the transport of men and material required.

NEW RAILCAR TRAIN ON TEST RUN

A new “Hargita” diesel-electric railcar train has been put on test before it goes into service on the Budapest-Nyiregyhaza line. It consists of two motor and two trailer coaches. Each motor coach is powered by a 450-HP Ganz-Jendrassik diesel engine, moving the train at a maximum speed of 77 m. p. h. The train seats 188 passengers, and was manufactured by the Ganz, Klement Gottwald and Dunakeszi factories.



Late S. R. Sarma.

Shri A. R. Rao, the Senior Deputy General Manager, who was Sarma's closest friend and colleague brought in the best talents in the medical profession but the cruel hand of fate snatched Sarma away from his friends. He was aged 52 at the time of his death. The leading citizens of Madras and Railway Officers and staff turned in large numbers to attend his funeral. A special wreath was placed by our General Manager Shri T. A. Joseph. By the death of Sarma the Railway world lost a giant. We take this opportunity of conveying our deepest sorrow to his aged mother, relatives and others.

Shri S. R. Sarma was the first Indian Chief Operating Superintendent of the ex-M.S.M. Railway and was the first COPS of the integrated Southern Railway. He was a *Bramachari* and hence devoted heart and soul to the work. He was the product of Indian nationalism. He was highly idealistic and this idealism without a practical touch brought him into conflict with others, but he managed everything smoothly with his tact which he possessed in abundance. The operating department of which he was the Head for well-nigh five years had the drive and push. He was a Rotarian and was a Governor of the District. In that capacity he had visited the United States of America. He was a prolific writer and as the First Public Relations Officer he did much spade work to place the organisation on a sound footing. Shri Sarma devoted heart and soul to satisfy the needs of the public in the matter of time-tabling of trains, supply of wagons and what not. In doing this he would expect that those who work under him should be equally zealous like him in getting things done. He was a hard task master. In spite of his rough exterior he had a very soft heart. In the premature death of Shri S. R. Sarma the Railway lost an able administrator which it is difficult to replace.

May his soul rest in peace.

WE regret to report the death of Sri S. R. Sarma, the Chief Operating Superintendent, Southern Railway at about 21-10 hours on Monday the 19th July 1954 in the Perambur Railway Hospital. The cause of death is reported to be due to a heart attack which took a sudden turn for the worst. Sri Sarma was in the hospital since the end of June for an operation and after recovery he was discharged on or about the fourteenth of July. It was expected that he would resume duty by 21st July 1954. On the 16th he got the heart attack and was again admitted to the Hospital. This attack proved fatal and the best of the medical aid by the Chief Medical Officer and his team of medical officers proved no avail.

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NOTES AND COMMENTS

OUR GM DISTRIBUTES NATIONAL PLAN LOAN CERTIFICATES

ON Saturday the 10th July 1954 a pleasant function was held in the courtyard of the General Offices when our General Manager Shri T. A. Joseph distributed the National Plan Loan certificates to the Officers and men who were present in large numbers. In the words of our beloved Prime Minister Nehru "This loan is addressed to every one in India. It is an invitation to all of us to join in this might adventure of building up new India. It is a way of showing that we shall stand on our own feet and not allow ourselves to be uprooted by the strong winds that might blow upon us from any quarter. The strength of a nation ultimately depends on its economic and industrial development bringing not only greater production but greater employment. All else flow from this. We are firmly resolved to build up our nation and make India united, strong and prosperous with friendship to all and malice to none."

"The institutional investors, like banks and insurance companies and others must, of course give their massive support to his loan. But this is essentially a popular loan going down to the humblest amongst us who should bear as much a share in this great adventure as anyone else."

In his introductory speech Mr. A. R. Rao, Senior Deputy General Manager emphasised the need for preserving our hard won independence which can only be done as our Prime Minister said is "by building up India with all the resources that we possess, of money, of human intelligence and labour, and of the will for a great, united and cooperative effort." The Railway Officers have set an example and within the short time nearly one lakh of rupees have been subscribed. He then requested the General Manager to distribute the certificates.

The General Manager then performed the pleasant function of distributing the certificates those present. In his concluding remarks he said that it was gratifying to him to note that the Railway Officers have wonderfully responded to the call of our Prime Minister for subscribing to the loan and this action is more eloquent than words. It is these officers on whom he has to depend to take the message of the Prime Minister to the ranks and he is confident that by their action they would be able to enthuse the rank and file of railwaymen for subscribing to the loan in a large measure.

With national anthem, the function came to a close.

RAILWAY EMPLOYEES UNION SUPPORTS THE NATIONAL PLAN LOAN

In their editorial dated 16-7-54 the Labour Time, the organ of the Southern Railway Employees Union has said :—

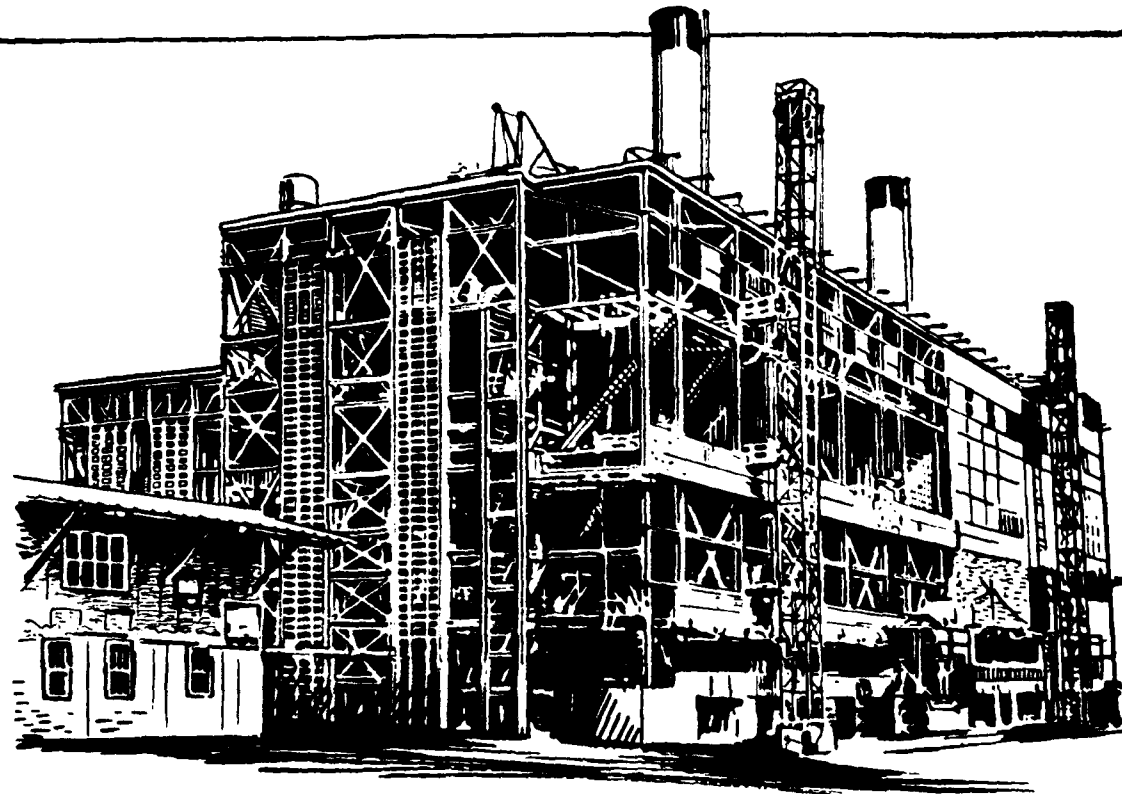
"The desire to directly participate in this great nation-building achievement should fill the heart of every true citizen of this ancient land of ours. The Prime Minister of India has to be congratulated for giving this opportunity to the common man by way of floating the National Plan loan. This loan has to be subscribed beyond expectation. It is for the country's development that is the goal, self-sufficiency, to solve unemployment problems, prosperity in short economic independence. To achieve these, other countries have shed blood, lives and have put themselves to great hardships.

In this task of building the Nation all citizens in general and railwaymen in particular have a very important part to play. They can show their loyalty, patriotism and duty to the country by coming forward to subscribe to this loan. It is a duty by which we have to stand.



"... I quite understand, Madam, but when I said children 'under three' are allowed free, I meant under three years of age—not under three feet.

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We would be right in expecting that all the railwaymen will subscribe liberally to this loan. It will give them the feeling that they are also participating in the improvement of the economic resources which will ultimately improve their own standard of living and India can take her rightful place amongst other nations.

OUR NEW COPS

We welcome our new Chief Operating Superintendent Shri M. C. Sivasankaran B. A., who by virtue of his service should have occupied this post long ago. Shri Sivasankaran, our readers must remember, is a great sportsman and he holds the record in cricket match in India which is not broken by anyone so far. He is a seasoned operating Officer, unostentatious but nonetheless painstaking and thorough. We are aware that he is asked only to officiate in the vacancy caused by the sudden death of Shri S. R. Sarma and the Board's final orders are awaited. But we are confident that the Railway Board will not overlook his claim as he is sufficiently senior and has before him barely two years to retire. Justice and fairplay requires that Shri Sivasankaran's case for the post of COPS is conceded. We hope that by the time this issue appears, orders would have been passed by the Board posting Shri Sivasankaran as COPS, Southern Railway.

WORKING OF LOST PROPERTY OFFICES TO BE IMPROVED

The six Zonal Railways are examining in detail the working of their respective lost property offices and suitable steps to remove any defect in the organisation of lost property offices and to increase their efficiency are to be taken.

In this connection it is interesting to note that the number of unconnected packages received at lost property offices during the quarter ended March 31, 1954, fell by nearly 1,600 as compared with the figures for the previous quarter. The number of packages lying in lost property offices declined by over 4,000 during the same period.

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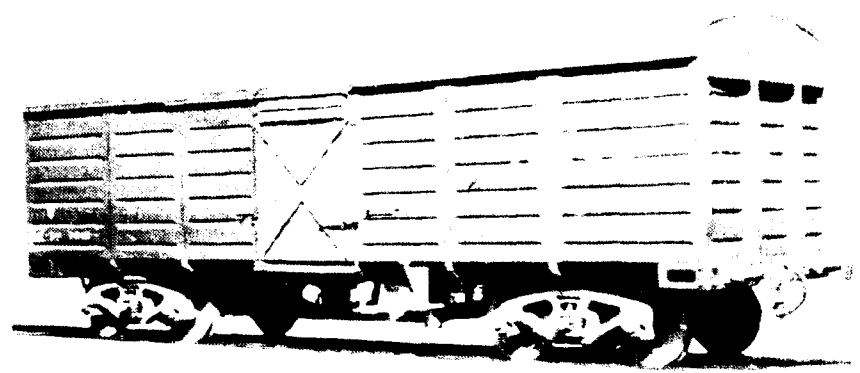
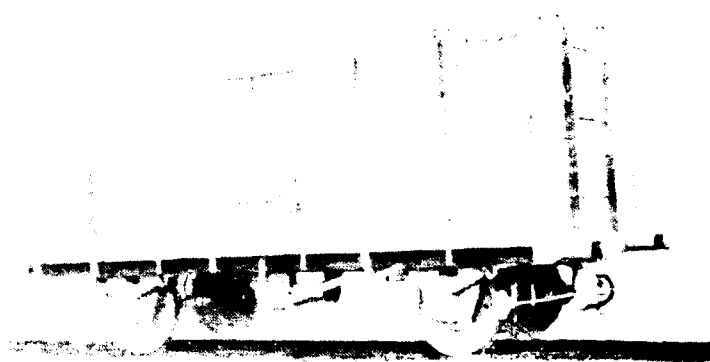
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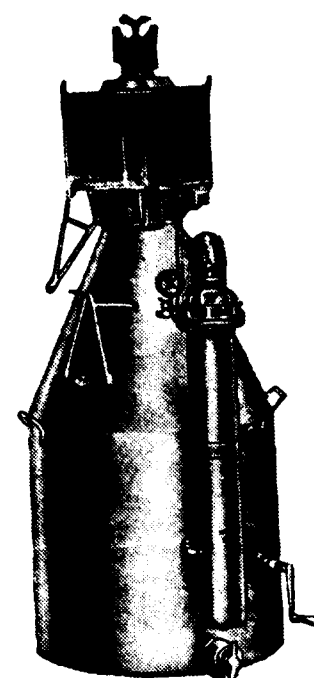
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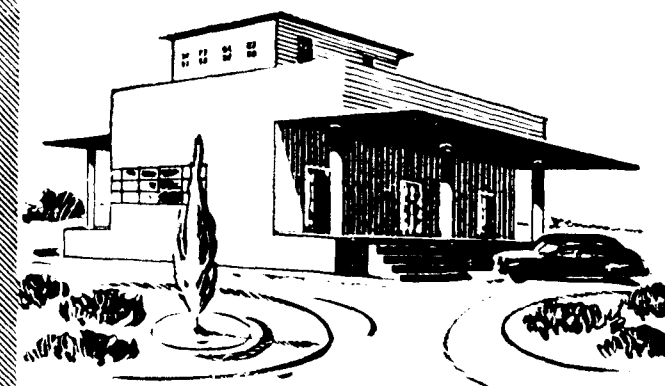
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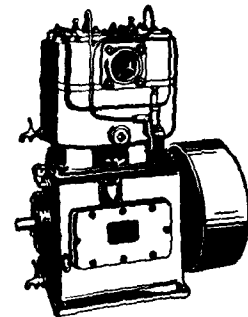
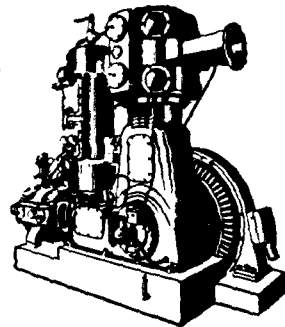
DALMIAPURAM — (TIRUCHIRAPALLI)

Misc. 134/161

Atlas Diesel

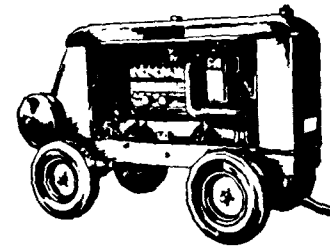
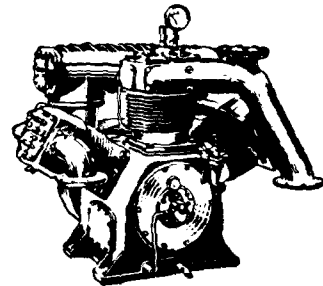
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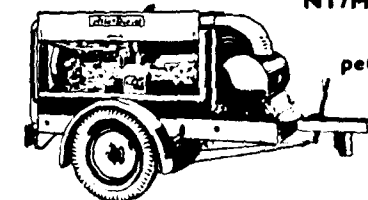
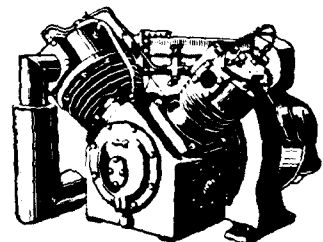
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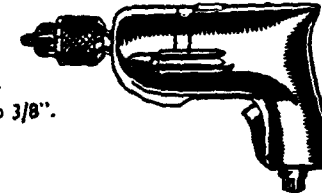


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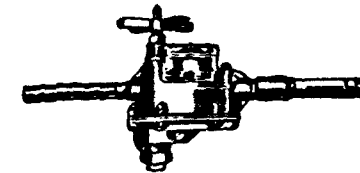
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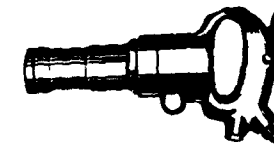
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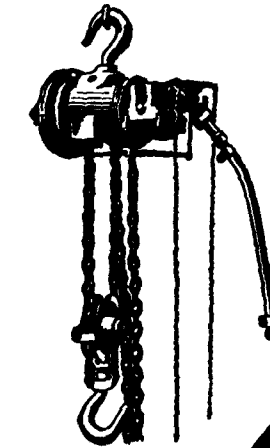
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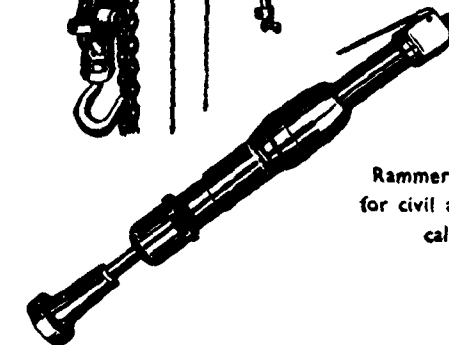
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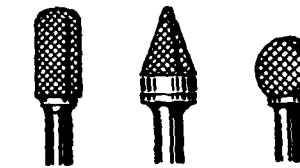
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THE week commencing 10th May brought a heat wave to London. The thermometer was recording temperatures over 80° which brought the women out in their summer frocks while men discarded their umbrellas and rain coats. However, as is usually the way in England when it gets very hot, by Wednesday 12th the weather became heavy and sultry and heavy thunder storms arrived. The temperatures dropped and much rain fell. Several people were killed by lightning. Heavy rain fell on Friday 14th and there was considerable apprehension as to what the weather would be like the

following day when the Queen would return to Westminster by means of the River Thames. Fortunately Saturday proved to be a dry day though dull, cold and cloudy. This, however, did not damp the wild enthusiasm of the Londoner's welcome for the Queen on her return from her commonwealth tour. There was great festivity and joy all over the capital and throughout the United Kingdom. Thousands and thousands of people flocked to town and once again the railways and London Transport were called upon to shift traffic throughout

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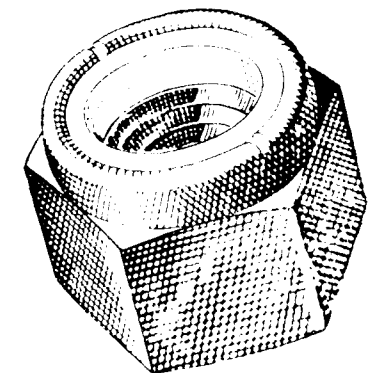
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the twenty four hours much above the average volume for the peak hours only.

London Transport has decided to scrap the trolleybus and replace them by Diesel buses of light weight construction. The changeover will be effective in about three years time and will take place in stages. However, in the southwest suburbs, the trolleybuses will remain for some considerable time yet. There are 64 trolleybus services with 253 miles of route. They carry 750,000,000 passengers a year or a fifth of London's road passengers. The reason for the change is that all the trolleybuses except those in the south west area, will have completed their useful lives. They will by that time have served Londoners for about 21 years. Each vehicle will have run something like 900,000 miles in service. After that it is considered that maintenance will be heavy and uneconomic and replacement by new vehicles will be necessary. The oil bus, which will replace them, will, subject to service tests, be of a new type. Two prototypes of the new design are expected to be under test before the end of the year. The changeover will be a big job involving some 1,600 vehicles, twice as many as in the South London tram conversion. London Transport said:—"Buses are more mobile in traffic and can maintain a more even service despite passenger surges and traffic congestion. Buses are more flexible in operation, so route extensions and diversions can be made where needed and services easily switched to new areas in accordance with population changes. Buses are not subject to mass holdups due to dewirements or other mishaps to a single bus or through power failure which can effect a large area.

Mrs. Emma Newport was sunning herself on the station platform at Beaconsfield waiting for a train back to her West Wycombe home. She was just sitting there thinking about nothing at all when the queer train glided in. It was a spotless green affair packed with gentlemen in bowler hats and armed with umbrellas and stop watches. "Goodness", she thought, "This is a new contraption—not a bit like the old one on this line". She was right: it was a new light weight diesel train, No. 79500, the first of its kind, on a trial run from Marylebone to Beaconsfield and back. It pulled out of London at 3-15 p. m. The train is the first of its type to be built under the British Transport Commissions £ 2,000,000 programme for the development of light weight diesel passenger services on British Railways, made in Derby it will go into service first in the West Riding of Yorkshire. The coaches are beautifully upholstered in blue and red, like the interior of a luxury limousine. Even the guard is provided with an armchair covered with spongy green leather.

The basis of the new service will be a two car unit, one vehicle powered by two bus type engines of at least 125 h. p. Each unit can be driven from either end or fitted into multiple unit trains of four, six or eight coaches. There is a hill between Denham and Beconsfield and just before reaching this, on the trial run, Sir John Benstead, Deputy Chairman of the British Transport Commission and Colonel G. R. Wilson, Chief Inspecting Officer, Ministry of Railways demanded that four of the eight engines be cut out — a gradient test. This made no difference to the train whatever and it just took the hill in its stride with no trouble whatever.

The Pullman Car Co. is the only portion of British Railways which has not yet been nationalised. The British Transport Commission has made an offer for all the ordinary capital. For the 900,000 "A" shares of 5 shillings the Commission is bidding 10s 6d. Its price for the 600,000 2s "B" units is 8s 6d. No offer is being made for the £386,000 4½% Preference Stock. There are 1,500 shareholders. The Directors own or control 105,990 "A" shares and 363,452 "B" and will recommend accepting the offer. Mr. Stanley Adams, Chairman of the Company, said that on a change of government there would always be the danger that the shares might be taken over at the current market rates. The "A" shares rose to 9s on the Stock Exchange and "B" Shares have recently stood around 6s 3d. Allowing for payments on staff pensions and compensations to directors for loss of office, the deal involves about £700,000. Under an agreement expiring in 1962, the company, which was registered in 1882, has the right to operate railway carriages carrying special accommodation and refreshment facilities in conjunction with the Commission's trains. It also runs regular trains of all Pullman stock. Among them are the Queen of Scots, from London to Edinburgh, the Golden Arrow and the Brighton Belle. In addition miscellaneous services are provided. Seven cars are now being used to make good a shortage of restaurants at the British Industries Fair. Catering arrangements were made at Apsley House during the Coronation. The Company's fleet at present consists of 206 cars. New ones would cost £17,000. This type of luxury travel was invented by George Mortimer Pullman (1831-97). He was born in Chautauqua, New York and in 1859 he began his designs for a new railway coach. In 1863 he built the first sleeping car. He carried out further improvements in railway carriages and in 1907 invented the corridor train and introduced dining cars. From his inventions he made a large fortune and founded the model town of Pullman later incorporated with Chicago. The Pullman Company of Britain provides luxury accommodation on certain trains and they pay a rental to the railways for

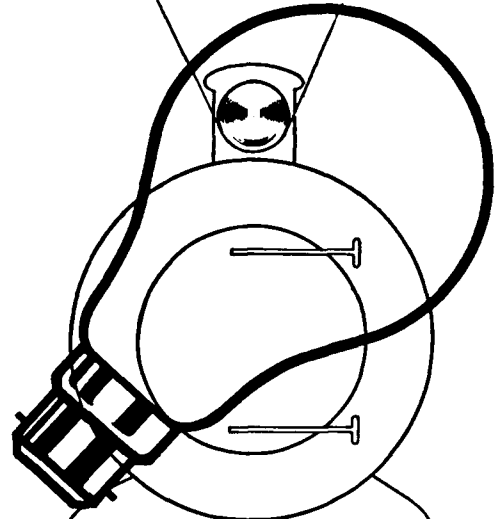
the inclusion of their cars in their trains. The Pullman Car Co. then charges a small supplement to all passengers using the cars and also derives revenue from the catering.

Every precaution is made to ensure that passengers do not fall between a train and a platform. In some cases, where the platform is on a sharp curve, there is an dangerous gap between the platform and the carriage step. At some stations on the London Transport tube railways such gaps exist and passenger's attention is drawn by bright lights fixed underneath the platform edge and by a stone step running along the platform wall which is whitewashed. Audible warnings are also given. But when passengers fall off platforms in front of expresses it is not expected that they will survive the accident. However, such a case did occur recently, where a mother and her two children fell in front of a fast train. Mrs. D. L. Perley, aged 27, of Rykneld Road, Littleover, Derby and her two children Jane Thomasine, seven months old and Susan Louise 4½, fell in front of the Devonian express as it ran into Derby railway station. The engine and ten coaches passed over them. she was holding the baby in her arms and the little girl by the hand when she was seen to fall off the platform. Mr. J. F. Painter a parcels foreman, crawled under the train. He said later that he did not expect to find them alive. He found the elder child sitting between the sleepers and crying. Her face was black with dirt and she had a black patch at the back of her head. The baby was not far away and it was whimpering. It was a miracle how all three escaped being cut to pieces.

Many of London's important buildings will be floodlit throughout the summer, from the beginning of June, until the end of September. They include Nelson's Column, Admiralty Arch, Admiralty Old Building, Horse Guards, the Tower of London, Carlton House Terrace, the Tate Gallery, Somerset House, the Houses of Parliament, the National Gallery and Trafalgar Square. St. Paul's Cathedral, Westminster Abbey and a number of privately owned buildings will also be floodlit.

British Railways summer rail plans include the introduction of 30 new expresses as part of the summer services. They will run from June 14. Twenty one services are to be speeded up. More sleeping cars will be put on and a new train will be run between Euston and Liverpool. Thirteen of the new services are across country. There will be four new Saturday trains from London to Midlands and the north to connect with Scotland and Wales.

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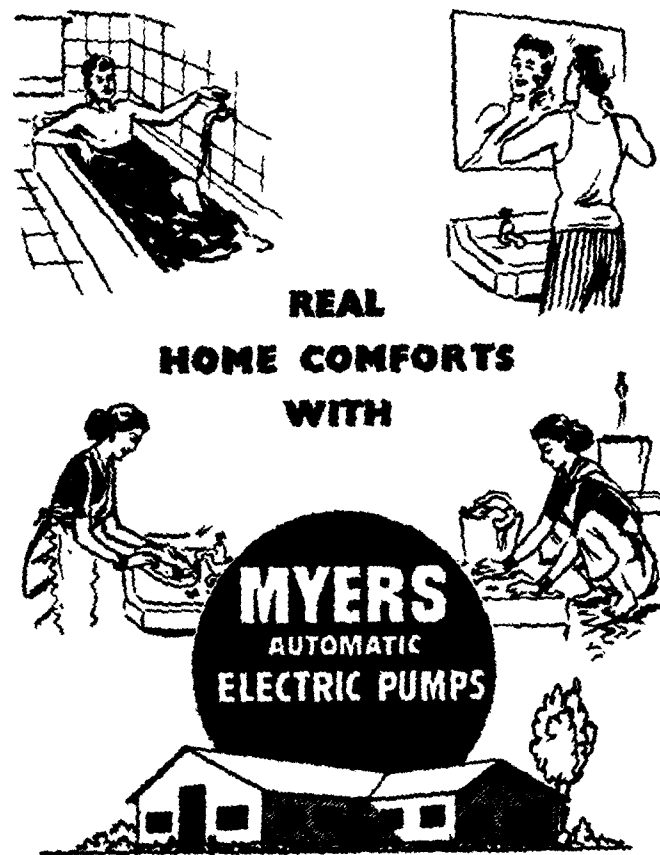
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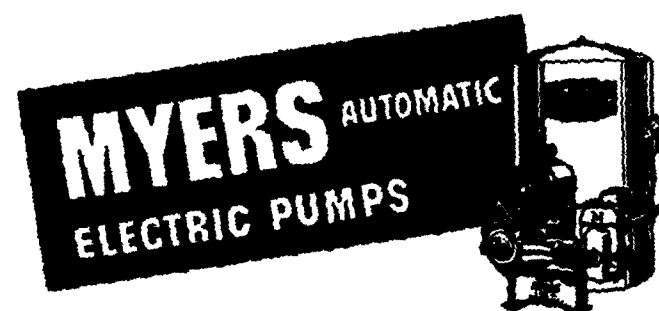
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From time to time railways are required to carry the queerest and sometimes the largest of loads. Sometimes they infringe the loading gauge and special provision has to be made and sometimes diversions around bridges arranged. The latest outsize load to be carried was a girder 128 feet long which was being transported for use in the construction of a new bridge between Hook and Basinstoke.

In the floods of 1953, many of the natural and artificial sea defences around the east coast of Britain were destroyed. Work on the restoration of the Lincolnshire defence has been completed at a total cost of £5,300,000. These figures were given when Mablethorpe and Sutton Urban Council celebrated the completion of their section of the defences. Sir Rupert De la Bere, former Lord Mayor of London and Chairman of the National Flood and Tempest Distress Fund, cut the tapes of the defences and declared them secure. At a celebration luncheon, Sir Robert Pattinson, Chairman of the Lincolnshire River Board, said to leading firms of contractors, 1,000 troops and 2,500 lorries were used in the construction.

Mr. Colin B. Hope is believed to be youngest station master on the southern region of British Railways, if not of the whole system. He started six years ago as a junior clerk at Hawkhurst, Kent and now at age 23, he is the station master there.

Immediately following the war it was difficult, if not impossible, to obtain a porter to shift your luggage. News comes from the USA of a coin operated barrow service. Put a coin of 25 cents (about 1 Rs. 3ans) in a slot and you unlock a luggage cart. Then you handle your own bags and if you have time before the train leaves to put the cart back in the rack the slot machine will return 10 cents (about 8 ans).

HAMMOCKS FOR BABIES ON TRAINS

Hammocks are to be installed in railway carriages in Hungary for babies and children.

As an experiment, 12 hammocks have already been fitted in the night train between Budapest and Pecs. The innovation will be introduced on other lines during this year.

The Problem of Interlocking the Non-Interlocked Stations on the Indian Railways and its Solution

By L. C. Mohindra, A.M.I.E.E. (Lond.), M.I.R.S.E. (Eng.)
Assistant Chief Design Engineer, Central Standards Office, New Delhi

The article first brings out the importance of providing interlocking at non-interlocked stations in the interest of an increased measure of safety and immensity of the problem in view of a large number of stations at present non-interlocked and the present day costs of providing interlocking to the present standards. The author then offers two signalling and interlocking schemes to meet the gigantic problem in the most economical manner. Each scheme has its own features and utility.

THE NUMBER OF NON-INTERLOCKED STATIONS ON THE INDIAN RAILWAYS AND THE ELEMENT OF INHERENT DANGER INVOLVED THEREAT

THERE are nearly 5,000 stations on the Indian Railways out of which over 2,100 are non-interlocked.

Whereas 10 to 20 per cent of the stations at present non-interlocked are large or are on important sections, the rest are just two line stations with one or two siding connections. At a majority of these stations some signals, however, do exist. These consist of either an outer and a home signal or an outer signal only in each direction. There is no interlocking between the signals and the points at such stations and it is possible for the signals to be taken 'off' regardless of the position of the facing points.

The setting of the points at non-interlocked stations is left to the Pointsman. Working instructions at such stations, however, do lay down that the Stationmaster and the pointsman have to exchange line labels for the reception line nominated by the Stationmaster. From the line label the pointsman knows the line on which the Stationmaster desires the train to be received. The exchange of line labels is also supposed to enable the authorities to fix responsibility in the event of an accident. The exchange of line labels, however, does not provide a guarantee that the pointsman will set the points as per Stationmaster's instructions and that he would lock them correctly. This obviously introduces human element and if the staff is not careful, there is a possibility of the reception signals being taken 'off' without the facing points having been set and locked in the correct position. This may result in a train being received at a station on a line which is different from the one required by the Stationmaster and if this happens to be occupied, an accident may result. There is also the possibility of signals being taken 'off'

when siding points may not be correctly lying for the proper running line. This may also result in a mishap. After the accident, it may be possible to fix responsibility and punish the staff, but considerable damage and possibly loss of life may have resulted all the same.

The element of inherent danger present at a non-interlocked station is generally well-known. There have been a number of accidents at non-interlocked stations and the need for providing interlocking at such stations has been felt for many years. When the Railways were first constructed, the traffic was light on certain sections and therefore a stage of non-interlocking may have been acceptable. Most of these sections have been in service for more than thirty or forty years and the traffic has since increased a great deal.

To deal with the increased traffic at these non-interlocked stations with safety, it is desirable that ways and means should be devised to remove the element of danger present there.

The Government Inspectors of Railways have also, from time to time, made recommendations for providing interlocking at non-interlocked stations while dealing with accidents in their annual reports. Extracts from some of the Railway Accident Reports by the Government Inspectors of Railways are given in Appendix A.

From the extracts of the reports of the Government Inspectors of Railways, it would be observed that several accidents have taken place at non-interlocked station, which could reasonably have been expected to be averted if interlocking had been existing at such stations. The Government Inspectors of Railways have also stressed the desirability of interlocking the non-interlocked stations, particularly on important lines in their respective jurisdictions.

It would be of interest to note that the Government Inspectors of Railways, while fully appreciating the difficulties in finding adequate funds, have often stressed

that if funds could not be found for providing complete interlocking according to the Railway standards of signalling and interlocking, some means of partial interlocking should be provided so that there is no possibility of a mistake by which reception signals are taken 'off' for a line different from the one permitted by the Stationmaster and further it should not be possible to alter the position of the points after the reception signals have been taken 'off'.

PRESENT PACE OF PROVIDING NEW INTER-LOCKING INSTALLATION AND THE CAUSE OF SLOW PACE

Although the desirability of providing interlocking at the non-interlocked stations has been urged for a long time, the total number of stations interlocked each year on all the Indian Railways has been less than 50 stations per year. This is due generally to the limited availability of funds. In the 'Five year Programme of Improvement to Railway Signalling' recently approved by the Railway Board, the number of stations proposed to be interlocked on all the six zones during the five year period is 243 only. Since there are over 2,100 stations still non-interlocked, at this rate it will take more than 40 years to interlock all of them. This does not take into account many other stations which may be opened on the new line in the meantime. It will be observed, therefore, that the rate at which interlocking is being provided is rather slow.

The reason why the interlocking of a greater number of stations has not been carried out, as stated earlier, is the shortage of funds and the all-round rise in the cost of material and labour. According to the present day prices, the cost of standard I interlocking at a two line station comes to about Rs. 19,000/- for two aspect signalling and Rs. 30,000/- for multiple aspect signalling. The cost of signalling is correspondingly more for a three line station. The cost of providing standard III interlocking comes to about Rs. 90,000/- per station for two line station and Rs. 1,10,000/- for a three line station.

PRESENT NEED FOR EVOLVING CHEAPER SIGNALLING

Since it is desirable to find ways and means of increasing the safety at the stations at present non-interlocked and the pace of undertaking the interlocking at such stations is slow due to the present day high cost of material and labour, there is a real need today of evolving some simple method of providing interlocking between signals and points so that essentials of safety are complied with.

SIMPLE INTERLOCKING INSTALLED AT NON-INTERLOCKED STATIONS ON THE AMRITSAR-PATHANKOT SECTION OF THE NORTHERN RAILWAY IN 1950-51

In 1949, the need to interlock the Amritsar-Pathankot Section of the Ex. E. P. Railway, where all stations were non-interlocked, became imperative, as it was necessary to provide an increased measure of safety for the movement of armed forces in connection with the hostilities then in Kashmir. Provision of signalling and interlocking to the railways' normal standards required considerable material and time. The problem of meeting the essential requirements of safety in the shortest possible time using the minimum possible material had then to be solved. Accordingly, a simple method of providing interlocking between the points and the signals (existing at the non-interlocked stations) was devised. The general arrangements then devised are shown on a plan at Appendix 'B'. It was termed 'Modified Non-interlocking'. The main features of this method of signalling are as under :—

- (a) The Stationmaster is provided with reception line keys—one for each reception line—viz. 'Stationmaster's main line key' and 'Stationmaster's loop line key' for a two line station. These keys are normally retained in the Stationmaster's custody.
- (b) Hand plunger triple key locks are provided at the facing points. The locks take three keys, viz.
 - i. SM's main line key,
 - ii. SM's loop line key,
 - iii. Signal Key.

The lock is of a special design so arranged that the signal key remains normally locked in it with the points free and the hand plunger lock in the mid-way position. The special feature is that by the application of the SM's main line key or the SM's loop line key, the signal key is released from the lock only after the facing points have been set and locked for the main or the loop line according to the SM's line key applied. Further, the extraction of the signal key locks the hand plunger in a position which holds the facing points locked in that position. The SM's main or the loop key is also then locked in.

- (c) A signal post lock is provided on each of the home signal posts so arranged that the home signal cannot be taken 'off' unless the signal key, normally locked in the hand plunger triple key lock at the facing points, is applied.
- (d) The outer signals are controlled through detachers fitted below the home signals. This permits the outer signal to be taken 'off' only after the home signal is correctly 'off'.
- (e) The siding points are fitted with a single key lock, the points being normally locked for the running line. The siding key may be the same as the SM's line key. This ensures that when the key is used for reception of a train, the siding points on that line are correctly locked for the particular reception line. At stations where the number of sidings is more than two, the siding keys may be separate but are suitably locked with SM's line keys in a key box retained under SM's custody.
- (f) This method of interlocking is quite capable of application with success to stations with more than two reception lines. In fact, it may be applied even to junction stations.
- (g) The cost of providing such interlocking at non-interlocked stations (equipped with home and outer signals generally existing at such stations) is estimated to cost approximately Rs. 2,000/- per station.

Since the signal key is to be applied in the signal post lock before the home and outer signals can be taken 'off' and the signal key can be extracted from the hand plunger key lock only after the facing points have been set and locked for the line according to the key given by the Stationmaster, it is possible for the reception signals to be taken 'off' only after the facing points have been set and locked for the line for which the Stationmaster has issued the Stationmaster's line key.

The proposed method provide essentials of interlocking between the points and the signs as well as full control of the Stationmaster over the signals. Interlocking of the siding point connections with the signals is also included in the signalling scheme. The home signal, however, for reasons of economy, was proposed to be continued as single armed. Since this does not distinguish the reception of a train on the loop line

from a reception on the main line, a driver was expected to observe a speed restriction of 10 miles per hour even when running through on the main line. The system of signalling was, therefore, termed 'Modified non-interlocking', even though it fully assures the basic requirements of safety.

The proposed signalling was accepted and the work was executed by the Railway in 1951-52. This interlocking has been in use since then on the section and has been found effective.

An article detailing the system of interlocking proposed was published in the Indian Railway Technical Bulletin of April 1951. The article contains full details of the proposed method of interlocking with the plans, estimates and the design of lock.

This method of interlocking was also discussed in the signalling and Interlocking Standards Committee held in Feb. 1952. The Committee passed the following Resolution :—

"The proposed method of increasing speed at non-interlocked stations was examined. The Committee consider that where non-interlocked stations have to be interlocked, interlocking in accordance with the standards laid down should be provided and do not recommend the proposed method for general adoption. It is understood that this method was designed at the time when material and funds for interlocking were not available".

While the Chief Signal & Tele-communication Engineers did not find anything specifically wrong with the proposed method of interlocking, they recommended that interlocking in accordance with the standard laid down should be provided.

With due regard to the opinion of Chief Signal and Telecommunication Engineers, the fact remains that the proposed interlocking provides for the following :—

- i. The reception signals cannot be taken 'off' unless relative facing points are correctly set and locked according to the Stationmaster's line key handed over by the Stationmaster to the Pointsman.
- ii. The position of the points cannot be altered after the signals have been taken 'off'.
- iii. The basic interlocking necessary to ensure safety is provided by the provision of a few additional lock at a small cost of nearly Rs. 2,000 only.

Thus the provisions made meet the recommendations made by the Government Inspectors of Railways, year after year, when reporting on accidents. The writer feels, therefore, that there should have been no objection to accepting the proposed austerity standard with a view to providing essentials of safety at such a large number of non-interlocked stations that each railway has, and thus undertake the gigantic problem with the limited funds available. This would no doubt have been consistent with the present economy of our country.

It may be stated that the Signal and Interlocking Standards Committee passed the resolution referred to in para above, they had the benefit of receiving a report on the actual working of the modified non-interlocking on the Amritsar-Pathankot Section which was completed in 1951. In this connection, it may be stated that a reference to this system of signalling appeared in the Railway Gazette of September 1953. An extract of the same is reproduced below.

ECONOMICAL KEY LOCKING IN INDIA

'An increase of traffic on a portion of the former Eastern Punjab Railway now part of the Northern Railway of India—where the single line stations were not interlocked, made it necessary to look for some inexpensive way of getting a reasonable degree of protection and assurance of the correct working of home and outer signals. It was considered essential to give the Stationmaster direct control over them and of course interlocking with the facing points had to be provided. An article in the Quarterly Technical Bulletin by Mr. L. C. Mohindra of the Central Standards Office describes the key interlocking apparatus which has been applied for the purpose and has proved very effective. A hand-worked f. p. plunger is operated by a pointsman, after setting the points in accordance with the main or loop key sent to him by the Stationmaster, and another key, then released, allows the home signal to be pulled off from the station. This in turn allows the pointsman to clear the outer signal from where he stands. Discordance between the two signals is prevented by a detacher on the home post. The cost is only a fifth of what standard I signalling would entail, and one fifteenth of that required for standard III cabin interlocking'.

As regards the experience of the traffic staff actually engaged on the Amritsar-Pathankot Section, enquiries made from the traffic and other officials after the introduction of the proposed interlocking show that the method has found great favour. This would be amply clear from the report of the Government Inspectors of

Railways for the year ending 31-3-52. The relevant extract of the report is reproduced below:—

SIGNALLING AND INTERLOCKING AMRITSAR-PATHANKOT SECTION

'The Stations on this section have been provided with modified type of non-interlocked signalling. Facing points have been fitted with S & F key locks and by handing over particular keys to the pointsmen, the Stationmaster assures himself that the points have been set and locked for a particular route. This is a great improvement on the ordinary non-interlocked working on other Branch lines'.

From the above, it would appear that the system of modified non-interlocking is satisfactory from the operating points of view and thus provides an increased measure of safety at the otherwise non-interlocked stations.

SIMPLE METHOD OF PROVIDING STANDARD I INTERLOCKING

As the Signal & Interlocking Standards Committee, had proposed the provision of interlocking in accordance with the standards laid down, the possibilities of providing interlocking to one of our standards at as low a cost as possible has also been under study since then.

While visiting the Newzealand and Australian Railways in 1951, the writer observed that the interlocking of their roadside stations is quite simple. On those railways, on a great majority of sections they have a single post home signal, with two arms one below the other. The top arm is for the main line, and the one below is for the loop line. These Railways have used this system for many years with great success and there has been no case where this may have caused any confusion to the drivers. This method, in addition, enables the capital expenditure of an installation to be reduced considerably.

The writer considers that this idea is worthy of very useful application on the Indian Railways, as it would enable the existing single armed home signals at non-interlocked stations to be continued without the need of replacement by bracketted home signals. The importance of this would be appreciated all the more when it is known that each two armed bracketted signals costs about Rs. 2,000/- and two such posts are required at each station. When we add to it the freight, carriage, erection and supervision charges, it amounts to nearly Rs. 6,000/- per station.

On the Indian Railways if we accept the placing of a loop home signal below a Main line home signal for two

line stations on branch line sections, it would enable the conversion of non-interlocked stations to Standard I interlocking at a very much reduced cost than if bracketted signals were to be provided.

It will be observed that if this system of signalling was accepted for an entire branch line section, the question of confusion with a possible outer and Warner combination would not arise. This is merely a question of changing the outlook which would yield us substantial returns. For further clarity the loop home signal arm could be fitted 10' to 12' below the main home signal arm and the size of the arm can be reduced so that even under the most adverse circumstances there is no possibility of confusion with any other combination.

POSSIBILITY OF REDUCTION IN THE RECURRING EXPENDITURE

Another point of interest learnt from the Newzealand and Australian Railways is that at roadside stations they have only one person in charge of the station in each shift without any pointsman to help him. This is achieved by keeping the facing points set and locked for the main line and their interlocking keys normally retained in the Stationmaster's custody at the station. The signal arrangements are such that when a train is to be received on the main line, the relevant signals can be taken 'off' by simply applying the key concerned in the controlling lever of the signal at the station. As regards the reception on the loop line, this is arranged by the Stationmaster by application of the key at the points. The general practice on those railways is to receive trains on the main line unless trains have to cross, in which case the Stationmaster himself has to proceed to the facing points and set them as required. With this method they require no pointsman. The conditions prevailing on the Newzealand and Australian Railways are, however, different and cannot be applied wholesale on the Indian Railways, but can suit the prevailing conditions with certain modifications.

On the Indian Railways, we have at present two pointsmen in each shift of duty, one for each end of the yard. Both the pointsmen are required to proceed for the reception of a train—one at the facing end and the other at the trailing end. To apply this principle of keeping the points normally locked for the Main line, a signalling and interlocking scheme has been devised with the following main features:—

- (i) The main and the loop home signal placed on the same post for two line stations.
- (ii) The facing points have been kept normally set and locked for the main line and their keys

retained in the personal custody of Stationmaster on duty at the station. The main line home signal levers are operated from the station and are released by the application of the facing point lock key (Main line key), normally at the station.

According to this procedure no pointsman need proceed to the facing points when a train has to be received on the main line.

- (iii) When a train has to be received on the loop line, it is necessary for the main line key normally at the station to be sent to the facing points. The pointsman then unlocks the facing points, sets them for the loop and releases loop home signal key. This key is applied in the loop home signal post lock fitted on the home signal post. This releases the loop home signal arm and enables the Stationmaster to pull the loop home signal lever and take 'off' the loop home signal. The pulling of the loop home signal lever also releases the outer signal lever at the station lever frame.
- (iv) The procedure of crossing trains at such stations would consist of the Stationmaster directing the pointsman to proceed with the main line key to the facing points in the direction from which a train has to be received on the loop line. The pointsman would have instructions to set and unlock the points, lock them for the loop line and arrange for the signal lock on the loop home arm to be freed. This having been done, the Station Master would take 'off' reception signals for the first of the two approaching trains on the line allotted without any further action by the pointsman. After a train on the loop line has been received, the pointsman would set and lock the points for the main line, ready for the other train to leave. He would then proceed to the trailing points and arrange despatch of the train on the loop line.

According to the above procedure the trailing points would be set in favour of approaching train and this would conform to the recent directive, according to which when trains have to cross, before signals for the first train are taken 'off' the points at the far end should be against this train and for the second train.

A plan showing the proposed method of interlocking, incorporating the feature of loop home signal being fitted below the main home signal, and the points normally

set and locked for the main line is at Appendix 'C'. The cost of conversion from non-interlocked to Standard I interlocking according to this method would be about Rs. 7000/- only per station. The details are given in the estimate at Appendix 'D'.

At stations where platforms are rail-level, it may be possible to adopt the procedure of normally receiving trains on the main line and thereby effecting saving in the recurring operating expenditure. This saving will amount to Rs. *3505-8-0 per annum where three pointsmen are saved and Rs. 2,200/- per annum where two pointsmen are saved. The introduction of signalling would thus be a sort of gold mine.

Considering the desirability of evolving a cheaper method of interlocking, consideration of the above-mentioned scheme was included in the agenda of the 27th meeting of the Signalling and Interlocking Standards Committee held in Feb. 1954. Extract of the resolution by the Committee is as under :—

- (i) "The Committee consider that the proposed method of signalling would be suitable for branch line sections and recommend that this may be tried.
- (ii) As regards the provision of loop line home signal below the main line home signal, the same may be accepted for branch lines where the complete section is equipped with Standard I interlocking without any distant/warner signal.

* Levermen.	Scale	Rs.	35-1-50
Average pay $\frac{\text{Max} + \text{Min}}{2}$	=	Rs.	42-8-0
Dearness allowance	=	Rs.	45-0-0
Leave Salary $\frac{\text{Pay} + \text{DA}}{20}$	=	Rs.	4-6-0
Gratuity = $\frac{\text{Pay} + \text{LS}}{24}$	=	Rs.	1-15-0
P. I. Fund	=	Rs.	3-9-0
Total expenditure for 1 man per month.	=	Rs.	97-6-0
Total expenditure for 1 man per annum.	=	Rs.	1,168-8-0
Total expenditure for 3 men per annum.	=	Rs.	3,505-8-0
Total expenditure for 2 men per annum.	=	Rs.	2,337-0-0

The following exception to Rule 1, Section D of Chapter VIII of the revised draft rules for the opening of a railway may be adopted—

'Exception (vi)—On branch line sections at two line stations where there are no warner signals the loop home signal arm may be placed on the same post and below the main home signal arm'.

From the above it would be observed that the Committee have accepted the method of proposed interlocking.

The question of providing rudimentary interlocking at non-interlocked stations has been raised from time to time. It is considered that provision of Standard I interlocking at stations, where saving in operating expenditure is possible, should be better than modified non-interlocking. But at others where saving in staff is not possible and provision of interlocking to proper standards cannot be taken in hand due to limited availability of funds, modified non-interlocking is obviously the answer.

Both the schemes have already been discussed in the Signal & Interlocking Standards Committee meetings and from signalling and safety point of view have been accepted. The choice can now be made by the Transportation Department in consultation with the Signal Engineers based on the requirement of each section.

CONCLUSIONS

1. To ensure increased measure of safety to the travelling public, it is desirable that non-interlocked stations should be interlocked. The number of non-interlocked stations on the Indian Railways is nearly 2,000. The cost of signalling a two-line station is approximately Rs. 20,000/- for Standard I and Rs. 90,000/- for Standard III and correspondingly more for a three line station. The cost of conversion of a non-interlocked station to Standard I with bracketted home signals is approximately Rs. 12,000/-. Due to the limited availability of funds and the enormous cost involved, the problem is gigantic and evolution of a more economical system of interlocking providing essentials of safety is an urgent necessity.
2. The solution of the above problem lies in providing either of the following methods of interlocking as a first step :—

- (i) Modified non-interlocking (details in para above)
 - (ii) Standard I interlocking, (details in paras above).
3. (a) The conversion of a non-interlocked station to "modified non-interlocked", which costs Rs. 2,000/- per station only, is obviously most economical, and should be provided where saving in operating staff is not feasible—See para 3(b) (i).
 - (b) Standard I interlocking as per design described in paras 13 and 14 costs Rs. 7,000/- for interlocking a 2 line non-interlocked station, and is worthy of adoption in preference to modified non-interlocking in the following circumstances :—
 - (i) At stations where saving can be effected in the number of pointsmen by keeping the points normally set and locked for the main line. This is feasible where traffic is not heavy, train crossings are not frequent and platforms are low.
 - (ii) Where traffic on the section demands Standard I interlocking.

The circumstance detailed in (i) above obtain at a large number of branch line stations. By adopting this system, saving in the recurring operation expenditure to the tune of Rs. 2,200/- can be effected at stations where two pointsmen can be saved and Rs. 3,500/- at stations where three pointsmen can be saved.

This saving would yield 30% to 50% return on the capital expenditure, in addition to other advantages of added safety and higher speeds through main line.

4. Both the proposed system of interlocking have been discussed in the Signalling and Interlocking Standards Committee Meetings and from the Signalling and safety points of view have been accepted. The gigantic problem of providing increased measure of safety at the non-interlocked stations can now be solved most economically by adopting either of the two proposed systems.

APPENDIX 'A'

Extract from some of the 'Railway Accident Reports by the Government Inspector of Railways' are reproduced below.

- (i) Extract from the report for the half year ending 31st March 1929 in connection with an accident at Bhatni Station Yard on the Ex-Bengal and North Western.
"Recommendations.

- (25) It is strongly urged that some system of interlocking points with signals should be introduced at an early date on the main line at least of the Bengal and North Western Railway. The traffic has long warranted it and the present programme of a few crossing stations and one junction a year is very inadequate. A much more rapid programme is necessary".

- (ii) Extract from the report for the half year ending 30th September 1935 in connection with an accident to 49 UP Grand Trunk Express at Gorandongri station on Itarsi-Nagpur Section on the Ex-G.I.P. Railway.

"Remarks.

I consider that in the interests of safety, the present non-interlocked stations on the Wardha-Balharshah and Itarsi-Nagpur Sections of the G. I. P. Railway should be wholly or at least partially interlocked. If funds are not available for the full locking of all stations according to G. I. P. Railway Standards, then at least one of the cheapest forms of the simplest key locking should be provided at least at the stations where passenger express trains run through daily".

- (iii) Extract from the report for the half year ending 30th September 1936 in connection with collision between No. 360 Down Mixed train and an Up Empty Mela Special at Kalyat on the Ex-North Western Railway.

"21. It must be admitted that though improbable, it is quite possible and it would undoubtedly be much better if the working were so arranged that once everything is set no alteration is possible without the Station Master's knowledge. To effect this, the only method is to make the Station Master himself go to the facing points and take possession of the key of the pad-lock after the points are locked. This cannot

be done without increasing staff as the Station Master on duty has also to attend to booking of luggage and passengers' tickets at these small stations.

22. An alternative is to fit all facing points with double facing points locks. The Pointsman after setting and locking the points returns one key to the Station Master and with this key in his possession the Station Master knows which line the points are set for, and he also knows that the points are locked and cannot be moved as long as he keeps the key ”.

(iv) Extract from the report for the half year ending 30th September 1937 in connection with a collision between 159 UP passenger and 170 Down passenger train at Santohpur on Ex-Eastern Bengal Railway.

25. “Remarks and Recommendations— This accident is one which would not have occurred, had the station been interlocked. I recommend that in the interest of safety, the present non-interlocked stations on busy suburban sections of the Eastern Bengal Railway should be interlocked or if funds do not permit, at least partially interlocked.

26. It is desirable that at non-interlocked stations, Home Signals should be detected through the respective facing points so that it may not be possible for pointsmen to alter the setting of the points after the Home signals have been lowered ”.

(v) Extract from the report for the half year ending 1946 dealing with an accident at Golandu Ghewar Bazar (B. A. Rly.)

‘ The cause of this accident was that the down facing points were incorrectly set for the loop line ’.

(vi) Extract from the report for the year ending 31st March, 1947 in connection with an accident at Bhatni on the Ex-O. T. Railway. :

‘ Recommendations were made and that important non-interlocked stations on the main line should be interlocked ’.

(vii) Extract from the report for the year ending 31st March, 1949 dealing with an accident at Kurukshetra (non-interlocked) on the Ex-E. P. Railway and Nawadah (non-interlocked) and Bhagalpur (non-interlocked) on the Ex-E. I. Railway as below.

“(vii) —Kurukshetra (E. P. Railway)—The accident was due to points No. 2 of Kurukshetra station (non-interlocked) having been wrongly set for the main siding on which the rake of an Empty Coaching Special had been stabled, with the result that 142 Down while leaving the station.....collided with the empty rake ”.

Recommendations were made to interlock Kurukshetra Station Yard.

“Nawadah (E. I. Railway)—Before the points were correctly set, signals were lowered and the latter train came on to the main line and collided head on with 282 down ”.

‘ Bhagalpur (E. I. Railway)—The accident was caused due to No. 23 Up passenger having been wrongly admitted to line No. 3 on which wagons were stabled. To avoid recurrence it was recommended that Bhagalpur station should be interlocked as soon as possible ’.

(viii) Extract from the report for the year ending 31st March 1950 in connection with a accident at Bataspur (non-interlocked) E. I. Railway

‘ The accident was caused by the incorrect setting of the down facing points at the station ’.

COST OF CONVERSION OF NON-INTERLOCKED STATIONS TO STANDARD I INTERLOCKING

No.	Description	Quantity	Rate	Unit	Total
1	Masonry for 6 lever frame	1	1,000	lot	1,000
2	Lever frame 6 levers	1	250	each	1,500
3	Lever locks single for loop lines	2	50	do.	100
4	Lever lock double for main lines	2	75	do.	150
5	S. M's key box	1	15	each	15
6	Gauge tie plates complete	2	20	do.	40
7	M. S. Plates for locks etc.	L. S.			20
8	H. P. lock triple, taking main keys and loop keys and signal keys complete with stretcher blades	2	250	do.	500
9	Switch extension pieces for detectors	4	10	do.	40
10	Solid joints 1½"	8	8	do.	64
11	Detector 2 way	2	110	do.	220
12	C. I. foundations	2	20	do.	40
13	Cement concrete	L. S.			40
14	Additional fittings for one arm below main home	2	250		500
15	Signal post lock single taking loop home key	2	100		200
16	Cabin wire adjusters	4	50		200
17	Wire adjusting screws	2	15		30
18	Cranks for signals	2	12		24
19	Vertical wheel double	3	12		36
20	Draft rope wheel	4	10		40
21	Horizontal wheels	2	12		24
22	Wire ropes	100 ft.	-/10/-		62
23	G. I. wire 7 strand	4 cwts.	45		180
24	Pulley stakes	75	3		225
25	Shackles, Thimbles, Sleeves Spitpins etc.	L. S.			50
26	Siding lock double	1	200		200
27	Siding lock single	1	100		100
28	Warning Boards	2	75		150
29	Speed Boards	2	50		100
30	Miscellaneous items	L. S.			50
31	Tools and Plant	L. S.			50
32	Labour and supervision	L. S.			500
					6450
33	Freight charges on stores. Rs. 5950/-		6	%	357
34	Carriage charges	L. S.			50
					6857
35	contingencies	5%			343
					7200
36	Less cost of 2 levers, and 2 wire connections to be released				200
					7000

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Since the British locomotive industry first began to design and build steam engines for the world's railways more than 100 years ago, the industry has remained in the vanguard of development and design. While steam still takes pride of place, the U. K. industry stands second to none in either the development or construction of all other forms of locomotive power. Recently the Diesel locomotive has taken its place as a power unit covering the widest range of modern railway requirements.

The 660-h. p. Diesel-electric locomotives used in New Zealand for hauling the Royal train during the Queen's recent Commonwealth tour were supplied by an English

firm. Examples of the application of Diesel-electric transmission to complete trains are the high-speed, five-coach, air-conditioned units supplied to Egyptian State Railways. Modified versions have also been supplied for suburban services, and three-car units for feeder services. Forty-eight Diesel-electric locomotives, each weighing 77½ tons and of 1,105 h. p., have been ordered by the Western Australian Government from a British firm.

The U. K. locomotive industry by virtue of its wide overseas interests has evolved over the years into an engineering and production group which can meet the most diverse conditions required abroad.

The present high level of activity in the industry can be noted from the figures for export of locomotives other than steam, which have steadily increased over the last few years from £ 1,800,000 in 1950 to £ 6,300,000 in 1953. This compares with exports of steam locomotives of about £ 7,500,000 in 1950 and £ 6,200,000 in 1953.



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COLLECTING A RAILWAY'S CASH

By A. H. Pearson

ANY business men will tell you that cash over the counter is the best method of keeping down bad debts in a commercial undertaking, and a railway administration, which is mainly a commercial enterprise selling transport, does most of its day-to-day transactions on a 'cash over the counter' basis.

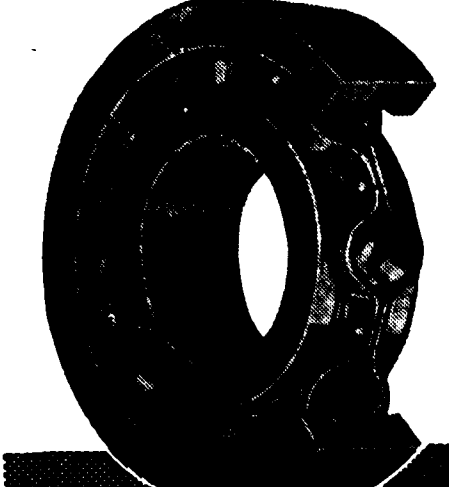
Now what are the sources from which a railway earns its daily cash? Each station on a railway can be likened unto a branch shop, and it is to this shop that the passenger who wants to travel by rail, or the merchant who desires to dispatch his merchandise and marketable products by train, comes with the cash price of the transport to be paid for.

The cash earning of a station come from two main sources, known as 'coaching' and 'goods'. The coaching earnings comprises all cash collected for the sale of passenger tickets from booking offices, the freight paid for all parcels for transit by passenger, express or mail trains, and also the freight charges collected on all parcels traffic received as 'to pay' at a station. Goods earnings consist of all cash received for merchandise booked at a station as freight 'paid', and also charges

collected on inward consignments received as freight 'to-pay'.

There are two other sources of a less important nature through which cash comes into a Railway's coffers, and these are known as 'Telegraph' cash, and 'Sundry'. The former are the earnings received from the charges paid for telegrams dispatched from the station on behalf of the public, and the latter consists of cash realized from the sale of unclaimed and misdispatched goods, sweepings, old records, rents of lands, dwelling houses, wharves, stalls, &c., and various other miscellaneous sundries.

Day by day at every station on a Railway, and practically throughout the twenty-four hours of a day at the larger stations where passenger tickets can be bought at any time, the booking and goods office staff on duty are collecting the railway's cash. Each transaction done either in the booking, parcel or goods offices is entered up in the appropriate accountal register or form, and at the end of each clerk's turn of shift duty, he makes over his cash to the supervisory staff concerned.



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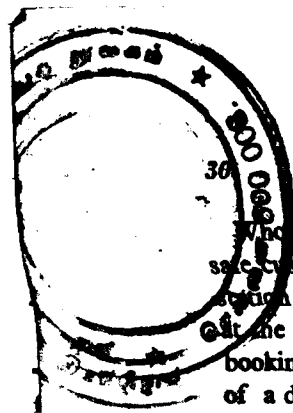
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Who is the railwayman responsible for the collection, safe custody and dispatch of all the cash collected at a station? At most stations, it is the Station Master, but at the larger junctions and termini, senior independent booking and goods clerks are responsible. At the end of a day's transactions at the average railway station,—by about 6 p.m.—the Station Master will take over the day's earnings from the head booking, parcel and goods clerks working under him. When taking over the cash the Station Master is required to sign the Cash Note or Notes and to personally satisfy himself by checking cash books with subsidiary books and other supporting documents that the correct amount of cash collected under each description of traffic is paid in.

All cash taken in during a day's transactions at a station must be prepared for dispatch in a particular way. In a small-size canvas bag marked 'Copper' all copper coins are put in, and in the larger canvas bags will be placed all silver coins, currency and credit notes, pay orders, or such other documents representing money, and what is known as the Cash Remittance Notes. Each of these canvas bags are tied tightly with the string attached to it and the gasketing sealed with the station seal. The canvas bags containing copper coins and the other bag containing other forms of coins and currency are then placed in a larger and strongly-made leather bag, and this bag containing all the station earnings is then tied and sealed according to the prescribed instructions. It is then ready to be put into the travelling cash safes for onward transit.

The station earnings contained in the leather bag is always accompanied by the Cash Remittance Note, on which full details of the contents of each of the bags are entered and signed by the station master or independent goods clerk.

Station cash is never kept more than about twenty-four hours at each station, as all cash must be sent either to the Chief Cashier at the headquarters office of the Railway, or to the Divisional Cash Offices, in accordance with the system followed on each Railway administration. By arrangement with the Operating Department certain trains over the various districts or divisions are nominated for the transport of all cash earnings of the stations over which the particular train must pass. When the nominated train arrives at a station, the Station Master himself, or the Assistant Station Master on duty, if the train happens to pass outside the normal duty hours of the Station Master, will place the station cash bag into the travelling iron cash safe in the presence of the Guard, who will give signature for the cash bag handed over, and who will keep a tally of all cash bags dropped into the travelling safe carried by him on the prescribed form.

When the train carrying the loaded cash safes arrive at the divisional headquarters or railway headquarters station, as the case may be, the Station Master on duty will personally open the luggage-van compartment containing the loaded cash cases. Each cash safe will then be examined personally by the Station Master in the presence of the Cash Office guard to see that the locks and labels are intact, and when all these details have been thoroughly checked, the cash safes are removed to the station strong room until the Cash Department's staff opens the safe and takes over the bags containing station remittances are taken over. The opening of each safe is done by the Cash Department man in the presence of a representative of the Operating Department, as once this has been done the responsibility of the Operating Department cases.

During this process of unloading the contents of each cash safe each bag taken out is carefully examined and checked and a record kept in a prescribed form, anything abnormal detected is immediately noted by Cash Department representative in the presence of Operating man. After this check all the leather cash bags are then placed in large canvas sacks—the contents of one safe going into one sack—and these are loaded in closed motor van, which then takes the cash under armed guard to the office of the Divisional Cashier, the Chief Cashier at headquarters.

When the closed van arrives at the Cash Office concerned it is opened by the Cash Department assistant with the duplicate key in his possession, and the sealed canvas sacks are then removed to the Counting Room. Here the cash bags are taken out of the sacks one by one and examined to see that the total number of bags entered in the appropriate register is correctly received. The bags are then replaced in sealed sacks and placed in the strong room until the process of opening and checking the contents of each cash bag is to be done. When all checking counting and accounting is done at the Cash offices, the cash is not kept, but sent in a closed motor van under armed guard to local branch of the Bank which acts as the Bankers to the State.

From the time that every copper, every coin, every note passes from the hands of the passenger at the booking office, or the merchant at the parcel or goods office to the Railway personnel required to collect such cash, till it reaches the divisional or headquarters cash office, and finally the bank, every reasonable precaution is taken for the safe custody transit and accountal of all Railway cash received from each station, and the amounts which come in daily may range from a few hundreds of rupees from smaller stations to ten thousand or more from large junctions or termini.

July 1954

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Buy your tickets in the proper time. You can avoid unnecessary excitement and trouble if you come to the station in good time, that is at least half an hour before the scheduled departure of your train. The Time Tables of the Railway are on sale at Booking Offices and Bookstalls.

Buy your tickets in the proper manner. Queue up at the Booking Window and you can get your ticket easier and quicker than by crowding at the counter.

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Check up your ticket and money before leaving the counter and draw the attention of the Booking Clerk to any discrepancy you may notice.

(Inserted in the interests of Travelling Public)

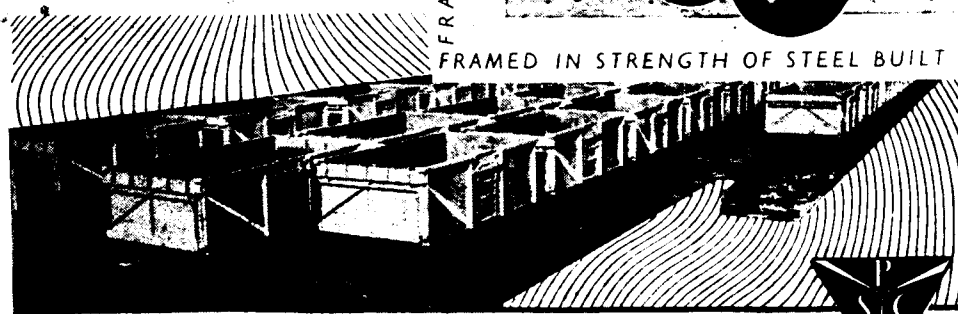
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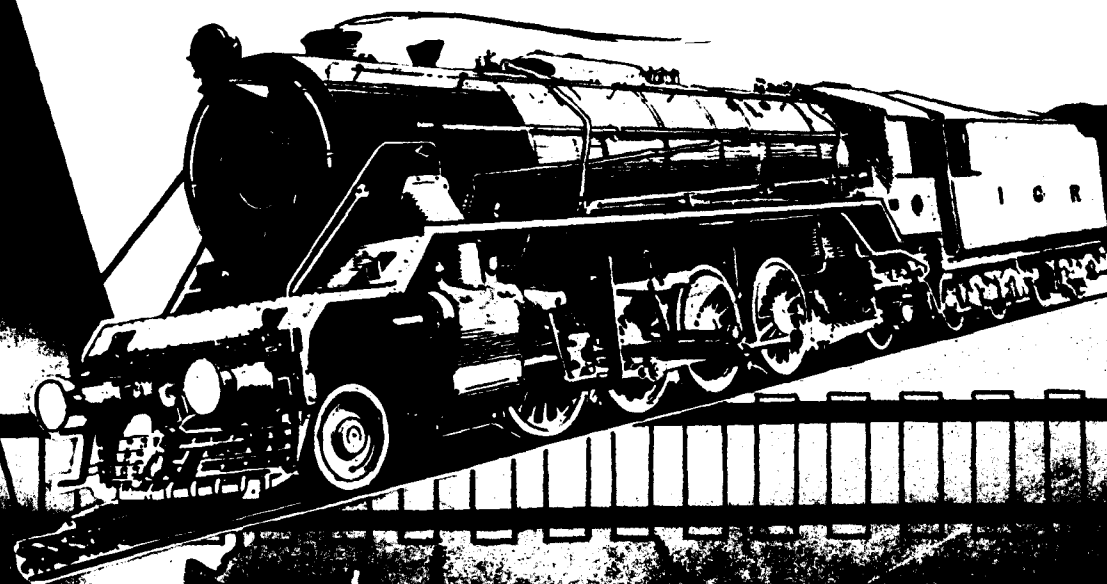
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SOUTHERN RAILWAYS MAGAZINE

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NO. 2

AUGUST

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LOOKING INTO THE FUTURE

A day of historic importance in the life of a nation invariably makes one think of the past and the future, of what has been done, and what remains to be done. On August 15, 1947 India came into her own, and on this same day of historic importance in 1954 India completes seven years of independence. Seven years are not a long period in the history of a nation, but in so far as India is concerned, within these years there has been considerable change in the nation's political and economic spheres. In the first three years the country achieved political integration under the able statesmanship of Sardar Patel. Economically, however, progress has been somewhat retarded by inflation, the enormous migration of refugees under distressing circumstances, and the unpleasant consequences of Partition. While tackling these gigantic problems Indian statesmen were faced with two successive crop failures and famine conditions in a number of places, and the complications created by the Korean war boom in certain commodities.

It was under these adverse conditions that the Government of India, under the able leadership of Prime Minister Jawaharlal Nehru, launched the first Five-Year Plan, the piloting of the plan being entrusted to India's Finance Minister Chintaman Deshmukh. From the second half of 1952, there was a definite turn for the better in the economic conditions of the country due to two favourable monsoons resulting in an appreciable increase in the country's overall food production. Considerable increases in other fields of the country's industry were also evident, and it was the cumulative effect of these favourable factors that helped the Government to break the inflationary pressure in the country. With less than a year and a half of the period of the first Five-Year Plan to go the Government of India has issued directives to all States to prepare and submit schemes for incorporation in the second Plan.

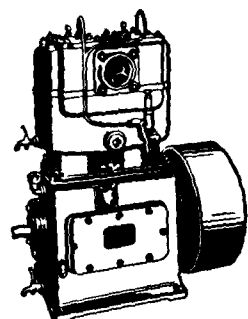
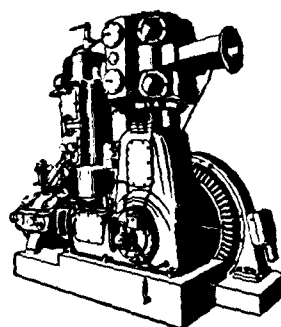
With this end in view the Railway Ministry has already had discussion with the Chief Engineers of Indian Railways on the scope of railway development under the second Five-Year Plan. The consensus of opinion at the meeting was that the railways should concentrate expenditure more on line capacity works and the laying of new lines under the second Plan than what had been utilised under the first Plan. Under the first plan the Railways proposed spending Rs. 400 crores for maintenance, rehabilitation and development schemes. Out of this amount Rs. 210 crores have already been spent during the first three years, while during the remaining two years of the first plan the amount remaining to be spent is Rs. 190 crores. During 1954-55 the provision for capital expenditure has been increased to Rs. 95 crores as against Rs. 78 crores in the preceding year. Under the first plan the allocations for new lines, special projects, major bridges, electrification of lines and conversion of lines from one gauge to another, have come to Rs. 28.52

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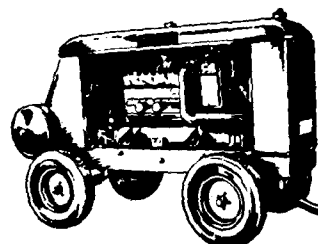
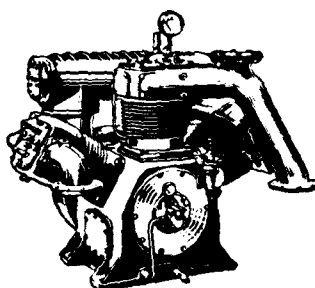
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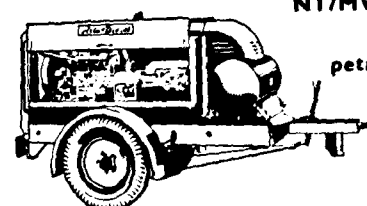
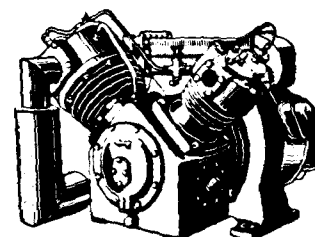
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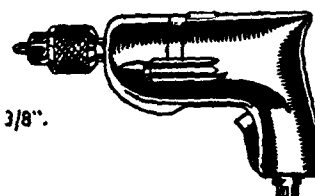


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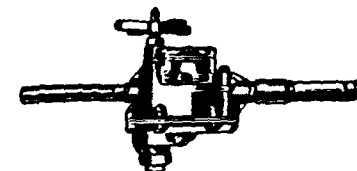
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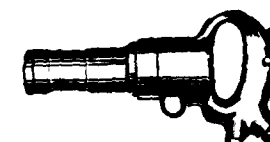
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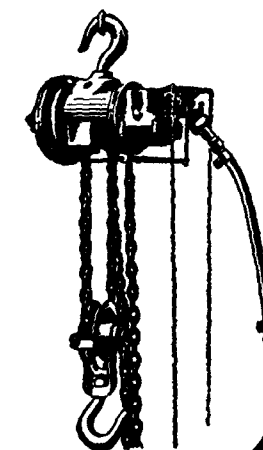
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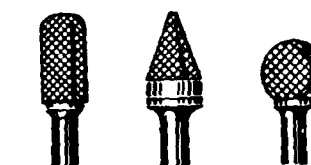
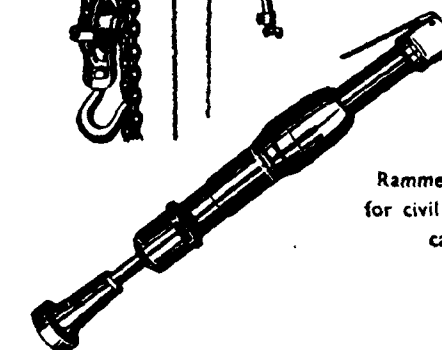


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EVEREST

crores. The allocation for track is Rs. 64.87 and for restoring dismantled lines is Rs. 5.66 crores. With the object of preparing indents for the commencement of works and for strengthening the purchase organisation, advance planning has now become imperative with regard to expansion schemes. Another item was subject for discussion at this meeting was the ways and means of speeding up the progress of works to increase the line capacity of railways included in the first Five-Year Plan and of implementing the heavy works programme proposed to be included in the second Plan. There are indications that the railways will probably suggest bigger expansion schemes for the second Five-Year Plan, and the total costs for these schemes will go up to about Rs. 700 to Rs. 800 crores, nearly double that of the first Plan.

If the trend of both political and economic conditions of the country continue as favourably and progressively as they have in since the latter half of 1952, there is every confidence in Government circles that the nation will be in a position to implement a much bigger plan during the coming years. In giving effect to the expansion of the agricultural and industrial capacity of the nation as contemplated in the second Five-Year Plan, the Railways will be called upon to carry traffic on a much bigger scale. Given the finance and other favourable conditions, especially in the field of labour, the Railway can be relied upon to fulfil their role in providing all that will be needed in extra line capacity to move the progressively increasing traffic, as well as a much higher standard of service and amenities for the millions of passengers who must travel by rail.

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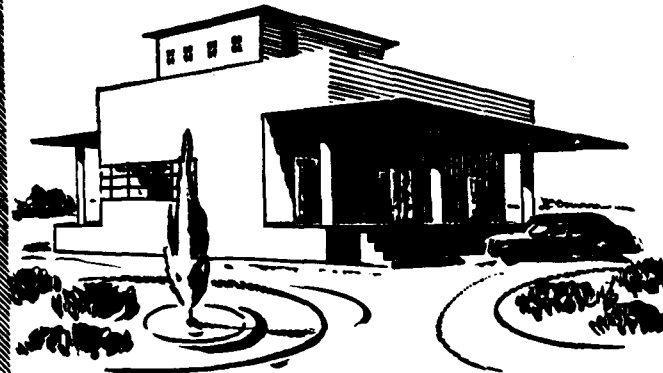


THE month of May had a large variety of weather and a wide range of temperature. The month opened with very cold weather snow falling in East Scotland and among the Pennines. There were only two relatively warm periods with temperatures above 70 degrees from the 10th to the 13th and in some districts during the last few days of the month. There were many days with sub-normal temperature. At Kew the day temperature was below the average for 21 days but there were 6 days when it was above 71 degrees, the highest being 81. Thunderstorms occurred from the 1st to the 4th, 10th to 13th and 25th to 30th while

they were wide-spread on 13th and 18th. While in some parts of the country over 2 inches of rain fell in twenty four hours, in others there was a drought from 15 to 18 days. The lack of sunshine was responsible for delayed growth in field and garden. In the Midlands and north Lancashire sunshine totals were 50 to 70 hours below average. From Essex to Kent and Hampshire, the shortage was 30 to 40 hours. Kew had 159 hours of sun, 33 below average.

At the time of writing this letter, the Whitsun holidays, 5th to 7th June, are now over and doubtless it

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was the most disappointing Whitsun, from the point of view of weather, for many a year. However, on Whit Sunday cloudy skies, heavy rain and gale force winds did not keep Whitsuntide holiday makers away from the coast. Road traffic was exceptionally heavy. Before midday on Whitsunday traffic jams lasting up to half an hour formed near the North Downs at Dorking, Surrey. The Automobile Association said that cars left London at the rate of 32,000 an hour. This is a record for last year the figure was 27,500. These figures do not take into account the many hundreds of thousands of motor cycle and ordinary cycles. By Whitmonday evening the holiday had been established as the wettest for 50 years. On the return journey from seaside resorts vehicles streamed through the rain at a rate of 48,000 per hour on 25 main roads. It was estimated that there were over four million vehicles on the roads during the day. In spite of all these difficulties, the standard of driving and road courtesy was higher than at any time since the war.

* * * * *

On the 15th May an unofficial strike started among the engine drivers and firemen of the Western Region. The strike started at Newton Abbot and quickly spread to Paddington, Bristol, Cardiff and Severn Tunnel. By May 25th only half the usual number of trains were running on the Western Region. Out of 1,807 drivers and firemen due to work at the depots, only 370 reported. The trouble was due to certain of the engine crews not accepting the lodging terms which are to be introduced by the British Transport Commission. These terms cover travelling allowance or lodging allowance payable to men who have to sleep one night away from their homes. The union leaders had accepted the terms and the action taken by union members was entirely irregular. After being out for nearly a fortnight they agreed to return to work providing their leaders again approached the British Transport Commission to re-consider this terms. Since the leaders had already agreed with the Commission, they find themselves in a very embarrassing position. The men are a fortnight's pay poorer for they do not receive allowances from their union for unauthorised strikes. They have also come in for much criticism from the public. The position is stated very clearly in a leading article in a London daily paper:-

"Whatever the result of the present unauthorised railway strike, there is one fact which needs to be grasped in all cases of this kind. It is that they are incompatible with maintaining in Great Britain a high standard of living.

Here is a great industry of national importance, which cannot pay its way. The workers in it have been granted one concession after another. They wanted nationalisation; they have it. They wanted the fullest recognition of, and consultation with, their trade unions; they have it. They wanted higher wages, and though they have not obtained all they asked, the comparison with what other workers earn is more in their favour today than ever previously. For all this the public are paying heavily in higher passenger fares and in higher freight rates which hit all other industries, and especially our export industries, making it harder for the country to pay for the food and raw materials upon which its standard of living depends.

The insolvency of the British railway system can be overcome only by lessening costs and increasing efficiency. This entails gradual, thorough reorganisation of both work and staffs. How can this be brought about without unfairness to the workers? Only by negotiating the changes every time the accredited trade-union representatives. In the present instance all these things have been done. The measures of reorganisation, against which the men revolted, had all received in detail full trade-union assent. Fifty years ago it would have been neither asked nor obtained. The change means a long step forward in human progress. But it cannot be maintained unless the workers show the same respect for their representatives which they expect the management to show. Unofficial strikes spell mere chaos; and upon chaos nothing constructive can be founded—neither higher living standards nor widened liberties".

* * * * *

An unusual accident occurred recently near Faringdon Street Station on the London Transport lines when a 10 ton lorry, loaded with cement, crashed through the parapet of a bridge in Farringdon Road, Clerkenwell after colliding with a car. Mounting a pavement 8 ft. wide, the lorry burst through a double thickness of brickwork and fell 30 feet, nose first on to one of the steam train trucks bringing a shower of debris, with it. At that moment a goods train emerged from the tunnel steaming hard against an incline. It ploughed through the wreckage pushing the lorry upside down against a wall. The driver and two passengers in the lorry were killed. Fireman, ambulance workers and railwaymen



Photograph of some of the exhibits showing, (left to right), B. R. lightweight diesel railcar, London Transport 1938 type surface stock driving car, London Transport 1938 type tube stock driving motor car, and London Transport 1949 type light alloy driving motor car.

worked by searchlight to lift the lorry and shift the masonry. Farringdon Street station was closed for about three quarters of an hour.

* * * * *

It is generally not necessary to divert trains for a simple derailment except where adjacent lines are infringed. There are circumstances where the contents of wagons makes this necessary and this was the case at Monwear-mouth Station, near Sunderland Central, when three trucks, two containing four tons of gunpowder, were derailed. The northbound Kings Cross—Newcastle train was diverted via Penshaw and Washington and the southbound Newcastle to Kings Cross by-passed Sunderland. The gunpowder was for a quarry.

* * * * *

Two expresses were saved from disaster by the agility of a retired railwayman. Mr. Harold Hill, who is 68 years old, saw that a stretch of a six foot wall had collapsed on to the main Middlesborough—Newcastle line near Thornaby-on-Tees. He ran 300 yds. to the station to warn the signaller who replaced signals in time to stop two express trains.

* * * * *

Sparks from locomotives caused more forest fires in Britain than all other causes put together. In the year ended September 30, they started 714 fires which devastated 111 acres of woodland. There were in all 1,253 forest fires which destroyed woodland to the value of £15,000.

* * * * *

Twenty six new forests were started in a record planting year. More than 118 million trees were planted on 67,610 acres, an increase of 10% on the previous year. Plantable land acquired during the year was 63,635 acres. This brought the total amount of land given to or acquired by the forest commissioners to 1,909,400 acres.

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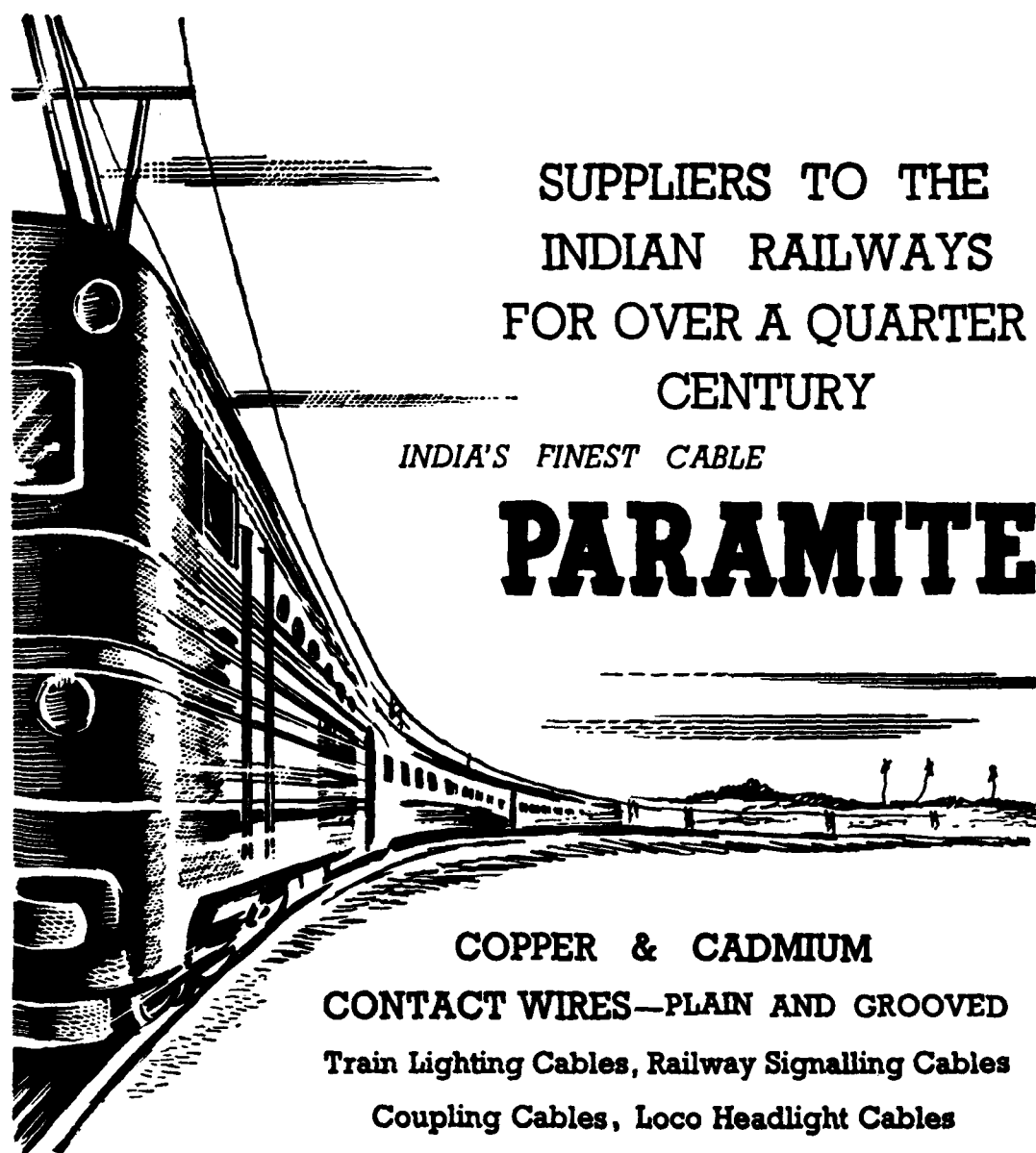
In pursuance of the policy formulated by the British Transport Commission regarding the closing of unremunerative branch lines, the passenger line from



Photograph of some of the exhibits showing (left to right), part of B. R. locomotive No. 71000 "Duke of Gloucester", B. R. class 4MT 2-6-4T locomotive No. 80084, B. R. class 7MT 4-6-2 locomotive No. 70037 "Hereward the Wake", B. R. class 5MT 4-6-0 No. 73050, B. R. class 3MT 2-6-0 No. 77009, Class EM2 Co-Co electric locomotive No. 27002, 2000 H. P. 1-Co-Co-1 Diesel Electric locomotive No. 10203.

(Photographs by courtesy of British Railways)

(Continued on page 19)



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SOUTHERN RAILWAYS MAGAZINE

9

SIGNALLING AND INTERLOCKING

By H. C. Towers, M. I. E. E., M. I. R. S. E., M. Inst. T.

Chapter 17. Colour light signals and shunting signals.

PEOPLE are accustomed to seeing signals with coloured lights on the highways of the world, whether on road or rail. What was a nine days wonder three decades ago is now an accepted feature.

On railways, semaphore signals are still mainly in use though on suburban areas they have been superseded by the light signal. The semaphore signal has of necessity to use lights at night in order to show what the arm position would convey by day. The light signal has sufficiently powerful aspects to be observed in daylight which brings the immediate advantage of a signal which shows the same type of aspect both by day and night. An added benefit is decreased maintenance due to absence of moving parts.

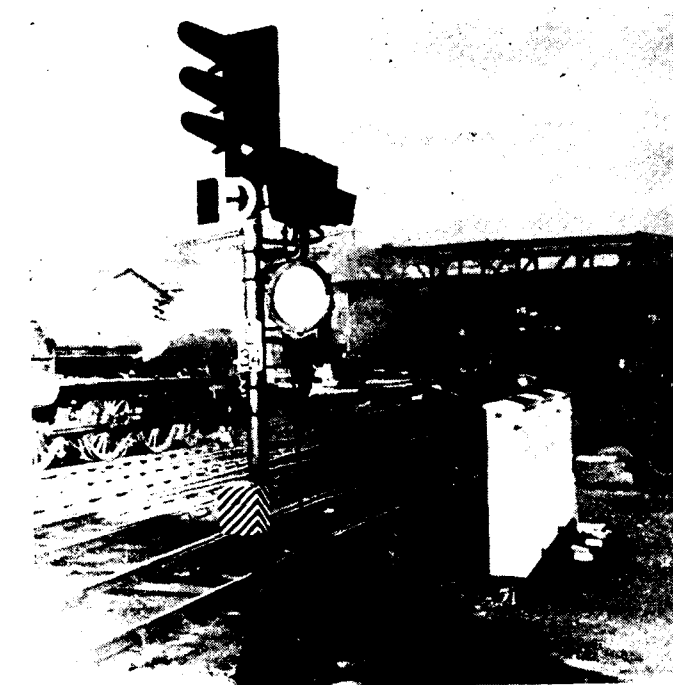
Experiments with colour light signals were carried out as far back as 1913 but were not successful. The London Underground Railways adopted a type of light signal about this period but it was really a short range signal. It was an ordinary lamp signal, as used in the tunnels, fixed on a post and surrounded by a deep hood to produce artificial shade to emphasise the aspects. Although used in daylight, they were mainly found in cuttings or sheltered places not subjected to direct sunlight.

The Liverpool Overhead was the first railway in the Commonwealth to adopt the colour light signal. Hitherto a system of automatic signalling had been in use invented by a Mr. Illius Timmins. The signals were semaphore operated by electric magnets and automatic operation was obtained by means of treadles and contact makers worked by the trains themselves. The new colour light signals were brought into operation on July 27th 1921 after one or two experiments on the main line railways. The work was successfully carried out by a well known signalling firm. The railway runs from Dingle to Seaforth Sands, along the west bank of the River Mersey, and for most of the way the tracks are elevated above street level. The signals could therefore be justly claimed as exhibiting their aspects against a predominantly sky background and their success was never disputed.

The London Underground Railways adopted two aspect colour light signals for their extension from Golders Green to Edgware. At that time, this type of signal was

often referred to as a daylight signal. Their installation was followed by others on the main line railways until today nearly every region of British Railways has colour light signals, approaching the London area and at many other places in the country.

The early types of colour light signals did not transmit a light beam of any great intensity and although they were considered suitable for short range signals, in countries where sunshine was scarce, their adoption in tropical countries was not seriously considered until five



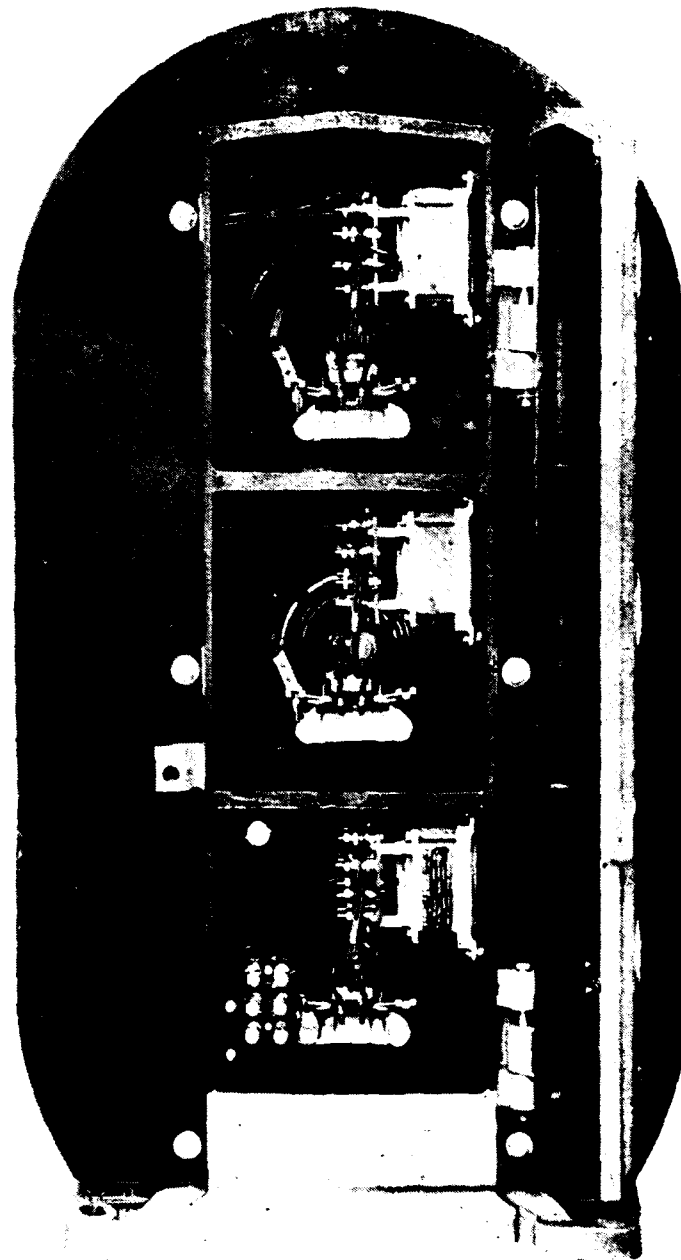
Three aspect colour light signal with stencil type route indicator and banner type subsidiary signal.

(Photo by courtesy of Siemens & General Electric Railway Signal Co. Ltd.)

or six years after their inception. Improvements in the design of lens and electric bulbs, with more concentrated filaments, improved their efficiency in brilliant sunlight.

Apart from constancy of aspect, the colour light signal is most suitable for use against bad backgrounds such as trees, buildings of certain colour, etc., where a semaphore arm could not be easily distinguished beyond a

certain range. In electrified areas, where the overhead system of current collection is in use, the overhead gantries for supporting the collecting or catenary wire seriously interfere with the sighting of semaphore signals. Some schools of thought maintain that by a suitable



Interior of colour light signal showing lamp fitting, transformers etc.

system of brackets and the judicious use of high posts, semaphore signals can be made suitable. Such a view is not supported by practical experience or the observations of the men on the footplate who, after all, are the principal users. The cross bracings at the corners of the overhead structures can be mistaken for the lowered position

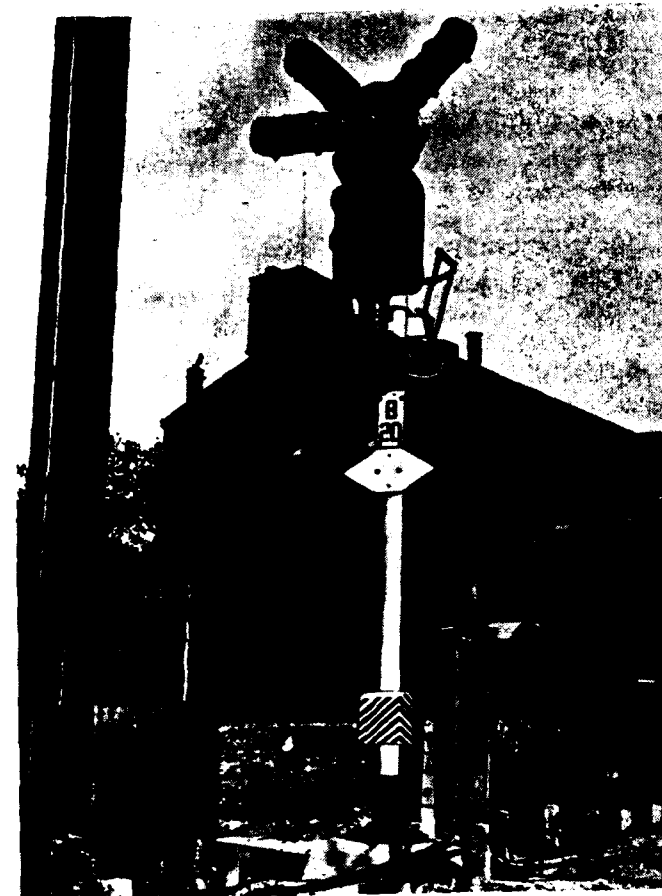
of a semaphore signal, particularly when rain or mist is present. The colour light signal is of such dimensions as to be easily accommodated inside the overhead structure so that its indication can be observed as though exhibited from the wall of a tunnel.

Quite apart from constancy of aspect, on itself an important consideration, the colour light signal has other advantages. Well known signalling firms, who have specialised in the development of this signal, have produced a piece of apparatus, which, by means of lamps with special filaments and a highly developed lens system, can produce light beams of great intensity and penetrating power. This is a great advantage during unfavourable atmospheric conditions and often makes it possible to dispense with the service of fogmen. Other advantages are the absence of moving parts, simplicity of mounting, and ability to place the aspect level with the driver's eye.

Owing to the fact that the colour light is designed to project a highly concentrated, non-divergent, beam of light, the aspect cannot be observed when a driver has halted his train close to the signal. To overcome this difficulty, special deflecting sectors are incorporated in the outer lens so that a small side beam is turned aside to enable the driver to observe which aspect is illuminated. As an alternative, small sidelight units, projected from the side of the lamp case, are provided. Many railways use both deflecting sectors and sidelights. Originally, the lamp cases were made of cast iron which made a fairly heavy construction. Modern cases are manufactured in aluminium, specially treated to resist corrosion. They are specially suitable for incorporating in existing gantries and for arranging light beams immediately adjacent to the line to which they apply.

Only one electric lamp is employed per aspect. It is a gas filled, double pole, double filament lamp having a main and an auxiliary filament which are arranged in parallel. The auxiliary filament acts as a standby should the main filament burn out. If specially required, two auxiliary filaments can be arranged. The type of lamp in general use is 12V 33W the line operating voltage being 110V. Each aspect is provided with a signal transformer, with tapplings, for stepping down from 110V to 12V.

The searchlight signal has certain advantages over the colour light and like other signal apparatus, is more applicable than others in special circumstances. One advantage is that only one lens is required, the actual colour of the light beam projected through the lens being changed by the mechanism inside the signal. This enables the signal lens to be positioned immediately



Three aspect colour light signal surmounted by junction indicator. The box pointed with black diagonal stripes contains a telephone.

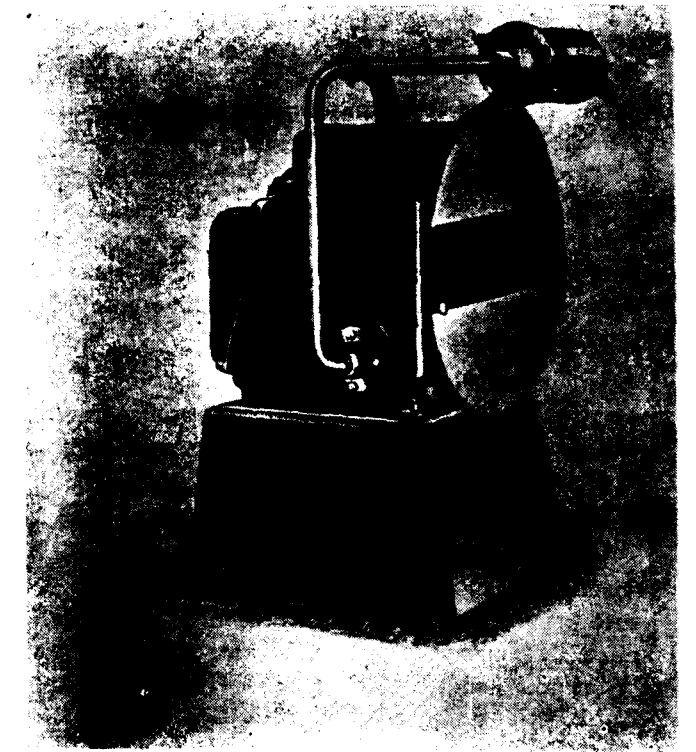
(Photo by courtesy of Metropolitan Vickers GRS Ltd.)

adjacent to the driver's eye. Another speciality is that these signals can be worked by battery power enabling light signals to be used on installations where an AC power supply is not available, as in up country districts in the Dominions.

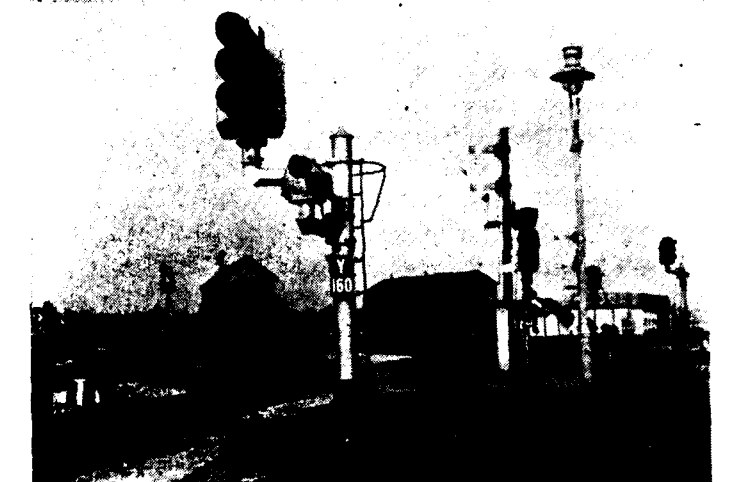
The inside of the signal consists of a polarised relay, either for AC or DC operation. The armature of this relay carries a small spectacle in which are mounted three coloured glass roundels. The roundel for the most restrictive (or red) aspect is mounted in the central or de-energised position. Arrangements are provided inside the signal to prove the lamp burning and the colour of the aspect displayed.

There are several kinds of shunting or subsidiary signals used with power signalling. On early installations these signals were miniature light signals at first showing small red and green lights and later, red and yellow. Today the general practice is to use disc signals

(Continued on page 12)



Solenoid operated disc type shunt signal, floodlit. (Photo by courtesy of Metropolitan Vickers GRS Ltd.)



Three aspect colour light signal with position light subsidiary signal beneath. (Photo by courtesy of Westinghouse Brake & Signals Ltd.)

or position lights. The disc signal consists of a plain white disc with a red bar on it. When the bar is horizontal, the signal is at danger. For the 'off' position, the disc is partially rotated so that the bar assumes the 45° position. These signals may be provided with small red and yellow lights at night or the lights may be

Australia Breaks Commerce Barrier

By Geoff de Fraga

EASIER FREIGHT HANDLING ON DIVERSE RAIL SYSTEMS

ALTHOUGH India has avoided the inconvenience of Australia's clearly defined rail gauge breaks the existence of various gauges in some parts lends interest to this Australian experiment to obviate one aspect of the problem.

Uniform steel freight containers are helping Australia overcome its decades-old troubles in handling interstate rail freight. For many years swift rail commerce between Australia's five mainland States has been gravely impeded by differences in rail gauges.

Due to classic bungling nearly a hundred years ago, when the Australian colonies were virtually a set of autonomous, unfederated states, the main gauges are of three different widths—4 ft. 8½ in. for New South Wales (the standard fixed in 1846 for the railways of Ireland); 5 ft. 3 in. for Victoria and part of South Australia (the standard fixed at the same time for the railways of England); and 3 ft. 6 in. in Queensland, Western Australia, Tasmania and the rest of South Australia—an arbitrary dimension which has resulted in the mainland's 3 ft. 6 in. gauges being separated by some 1500 miles of other gauges.

The result is that it has never been possible to use any one State's rolling stock in an adjacent State; and since 1883, when Victoria's English track touched New South Wales' Irish track over the new River Murray bridge at Albury, the country has borne the expense and inconvenience of transference of passengers, goods and livestock from one train to another.

This dislocation was brought into vivid focus by the wartime movements of troops, munitions and supplies.

Many Plans have been put forward for gauge unification—costing big sums ranging up to £A400,000,000—but none has been carried out.

The recent introduction of the steel, weatherproof containers, with their guarantee of door-to-door delivery, is therefore overcoming one of the country's chief barriers to interstate commerce. Shoes recently forwarded the 591 miles from Melbourne to Sydney were on sale in the shops two days after leaving Melbourne.

The containers, which have a capacity of 5½ tons or 320 cubic feet, appeal to consignors for more reasons than the speedy handling, which is effected by truck-to-truck gantry-hoisting at Albury. Handling of goods is minimised, packaging costs are cut down, and pilfering is eliminated completely.

For a freight charge of £A45 between Sydney and Melbourne, the consignor can now load his container in his own premises, and have it delivered within 48 hours to a consignee 600 miles away.

Special trucks to hold four containers have been provided by the New South Wales Railways. They have a locking device to attach each lower corner of each container firmly to the floor of the truck, and thus provide for safe transportation at speeds of over 60 miles per hour.

Two hundred containers are already in continual use between Melbourne and Sydney, Australia's two biggest cities. Two have been specially provided with steel floors to carry highly inflammable material regularly consigned by Imperial Chemical Industries of Australia and New Zealand.

(Continued from page 11)

dispensed with and the disc floodlit the latter being modern practice. The disc is rotated by electric motor or electric solenoid. Where the latter method is used, the operating circuit is the standard 110Volts Alternating current but it is converted to direct current for working the solenoid by a rectifier in the signal.

The position light signal consists of a line of white lunar lights arranged in the horizontal and the inclined 45° position upper quadrant position. When the horizontal lights are illuminated the signal is at danger and when these are out and the other set illuminated, the

signal is at 'clear'. Where subsidiary signals are placed underneath colour light signals such as Homes or Starters, very often the danger aspect is not used at all as this is already being displayed by the main signal. The yellow aspect is given or the 45° aspect for a shunt movement past the main signal, the signal otherwise being normally unilluminated.

It is customary to electrically repeat the position of every signal aspect, whether colour light or subsidiary, on the lever plate behind the levers in a power frame or on the relay interlocking panel or illuminated diagram where the OCS system is in use. (To be continued)

International Railway Congress in London

INDIAN DELEGATES TO ATTEND

OVER 450 delegates from more than 30 countries are expected to attend the International Railway Congress to be held in London this summer. Meeting from May 19 to 26 at Church House, Westminster, the Congress will be the first international gathering of its kind to be convened in Britain since 1925.

The British Transport Commission, the organisers, say that Indian Railways have accepted their invitation to send a delegation. The Congress will be opened by the Duke of Gloucester, supported by the Minister of Transport, Mr. Alan Lennox-Boyd, and leading members of the Transport Commission and the London Transport Executive.

The International Railway Congress will discuss a wide range of current problems and latest techniques, including maintenance, finance, electrification, staff

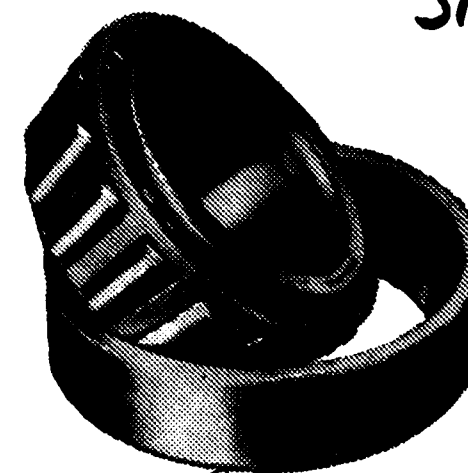
recruitment, communications, participation in road transport, and modernisation of buildings. A great deal of international data has been gathered for the delegates' consideration by leading British officials.

SPECIAL EXHIBITION

In addition to taking part in seven business sessions and sectional discussions, overseas delegates will be taken to see important railway centres in Britain where they will inspect recent technical developments. There is to be a special exhibition of British Railways and London Transport locomotives, rolling stock, and civil and signal engineering equipment.

Seven leading trade organisations are co-operating with the Federation of British Industries in offering facilities for delegates from overseas railway administrations to visit factories and industrial plants in various parts of the country to inspect the latest products.

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HOW RAILWAYS USE RADIO

By A. H. Pearson

SINCE railways began, the long and heavy goods trains always have to be pushed into sidings and loops to give way to the faster mail, express and passenger trains. Loco and traffic train crews working these freight trains always see "red" when they are making good time on the run, and then as their train is rumbling into a station they see the signal check that side-tracks it into a passing loop line. There the goods train will tarry, perhaps for an hour, while the swift, but shorter and lighter mail train will suddenly roar through, with the crew of the mail loco grinning at his counterpart on the goods loco.

This side-tracking of freight trains for the faster passenger trains is common railway practice the world over, and the Southern Pacific Railway in the United States of America is no exception. Keeping a fast mail train with a loco and a string of fifteen coaches under control over stretches of railroad winding around mountainous country is not so difficult. But when it comes to a heavily-loaded freight train with a humming diesel loco hauling a string of eighty odd wagons almost a mile long is quite another matter, especially with the guard and train crew far back in the brake-van with no means of communicating engine crew. But now a new electronic eye that sees over humps and round curves allows goods trains to rumble over grades on fast-train schedules, often cutting off two to three hours of the time to make a day's or night's run.

Now let us watch how electronics help in train operation. Freight train 908 is panting to get started. Signals wink from red to green. The driver of 908 starts his diesel loco pounding the tracks and the train is now pulling out on to the main running line. No brakemen wave papers to relay signals from the guard's van to the driver's cab. No whistle shrills from the loco. Instead, over what is known as a radio "sqawk" box the guard's voice booms out "All clear, let's go". The driver picks up a hand-phone hanging near the throttle and says "Driver to guard, 908 pulling out".

In yard offices, other locomotives, and guard's vans a dozen radiophones pick up the exchange and all concerned know that 908 is pulling out on to the main track.

The diesel loco with its mile long freight cars hum along smoothly. A dozen miles up the section the driver of 908 picks up a call. The call is from another railroad man paralleling the freight train by road in a

car. This man has spotted a couple of men taking a free ride on the goods train, and the driver of 908 is told to get these men off the train before they come to the tunnel in the mountain side some few miles ahead. The driver eases down his train and from the rear brake-van the guard calls over the squawk box that the free riders have jumped off.

A few stations ahead 908 gets a call from a train in the opposite direction, "Give us a rolling inspection". As the trains pass each other the crew of 908 keep their eyes sharp on the wheels of each freight car of the other train as she rumbles past. The brakeman of 908 spots a hot box on a wagon of the other train, and to indicate this, he holds his nose a gesture which means "you've got a hot box". In the old days to deal with this, the other train would have had to stop, put out a warning signal for traffic in rear, while the brakeman searched for the wagon with the smoking hot box to see how serious it was. Now the train keeps moving, because the guard of 908 teletalks to the driver of the other train and tells him that he has a hot box on the 30th wagon from the rear, and even advises him whether the box needs immediate attention or can hold out till the next stop.

On single line tracks winding round mountains, where there are no straight stretches of track, passing sidings are built around curves every dozen miles to allow for two-way traffic. This curve is so crooked that it required about a half-dozen brakemen waving newspapers or signal lamps to relay signals from brake-van to engine and vice-versa. But what happens now? The single brakeman on duty slings a light-weight walkie-talkie (portable radio transmitter and receiver) on to his back and hurries up the track. After he uncouples the train behind the wagon with the hot axle, he gives instructions to the driver who is on his loco perhaps half a mile around the mountain. The brakeman next directs the shunting of the disabled wagon on to a short spur siding, then talking all the time through his walkie-talkie completes the shunting operations to get the train joined together again minus the hot-axle wagon. Within ten minutes the heavy freighter is rolling again. With the old method of hand signals, even a minor mishap like this would have taken an hour to straighten out, and blocked traffic on the line in both directions.

Radio communication of this nature expedites trains movements enormously especially on sections running

through mountains, as whatever may be the condition of the track, or block sections, the crew of the train noticing anything that may retard speed, or lead to an accident, can pass on the information through his radio phones to other trains on line and to stations.

Next we take a look at electronic aids in large marshalling-yards. In one such yard on an American railroad where up to 6,500 wagons of all types are regrouped into trains forking out for various directions, loud-speakers have been installed at strategic points. As soon as a goods train rolls into a stop, a numberraker starts walking the track along side this train. He tallies each wagon and speaks the number, destination, &c. into the mouthpiece of his walkie-talkie. In the yardmaster's office the yard clerk checks this report with the list sent from the preceding divisional point. If a wagon has been damaged and detached along the line, the yardmaster ought to know it at once, because any moment the train will be shunted over the hump.

This hump is only a few feet high and complete with tracks, towers and switches. As each line of wagons is slowly pushed up one side of this slight elevation, a battery of electronic eyes come into action.

The first are those of a team of inspectors. Instead of walking along the side of the train and looking underneath each wagon for defects, they sit in glassed pits on

each side of the train, watching two large mirrors beside the tracks as bright lights shoot beams on to the passing wheels and brake gearing. Any defects noticed are reported to the head hump-master in No. 1 tower.

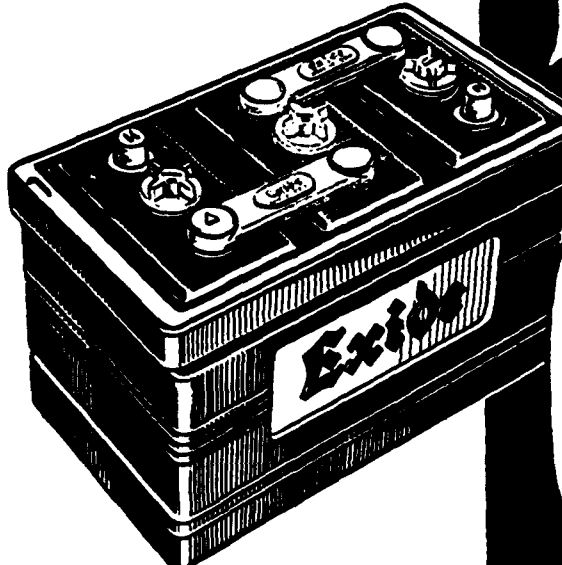
The hump-master scans the list of trucks flashed over from the yardmaster's office, and flips over switch levers while a train rolls slowly over the hump. This operation is known as building trains, as from the yard lists he knows where each wagon is bound for and so arranges to switch them on to the tracks where trains for each destination are being marshalled.

From the hump the trucks roll, sometimes four or five to the minute, on to a dozen tracks sloped enough that the wagons couple themselves without banging. Gravity plus electronics has doubled the handling capacity of large yards, and yardmen who once risked life and limb hanging on to wagons pushed from one track to another by yard pilot engines, now do the job by pushing a button.

Electronics to the aid of railways has come to stay, and perhaps it will not be long before our Railways in India will be installing electronic instruments in train control offices, yards, cabins and stations, and we will almost have the age of running railways by stabbing a finger on a plastic push button.

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COGS IN THE WHEEL (IX)

By Ajax

I have often noticed friends in office writing something in a scribbling note book first thing in the morning. Out of curiosity I asked a friend what it was and what it really meant. He replied to say that he was in the habit of writing one hundred times the name of "*Kalimai*" and then begin the day's work so that he might not err in the course of the day.

In other words, it was a prayer, an invocation to God to lead you along the right path. Prayer is good in itself; it soothes your nerves, tones your system and ennoble your mind. It lifts you above petty skirmishes and reaches you to an altitude wherefrom you visualise the greater things of life.

But I often think that even a prayer done mechanically loses its intrinsic value. The process becomes so very mechanical that its very thought is a daily routine affair and is often devoid of that inner feeling which alone can send a thrill across the frame of your body.

If prayers are offered in the fullest realisation of the greater things of life and are uttered in all sincerity they are sure to pull you out of any difficulty.

But then the prayerful mood comes to us only occasionally. I wish every one of us every moment of our life thought of the Almighty the God and were conscious of the fact that nothing in this world moves without it being ordained by Him. It is not necessary for you to go to the Church, the Temple or the Mosque; it is not necessary for you to put on ashes and pretend to be godly; it is not necessary for you to go about preaching the *Sermon on the Mount* or the great deeds of seers. All that is necessary is to feel within yourself the awareness of God and his presence and in that awareness shape your conduct in daily life.

In our official sphere we have ample opportunities of helping our brethren in small and simple ways. It may be a good act, a kindly word, a sympathetic attitude, a



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little toleration, and a little humane understanding, or readiness to help and willingness to listen.

Listening to what is being told to you is a great virtue. It gives satisfaction to the teller that he has had a good hearing, and even if things do not get themselves rightened in course of time, it does not matter, for he has had the satisfaction of having told and listened to patiently. That is a great asset.

Further, the act of your listening to your friend has a far reaching effect, for in the wake of his satisfaction he goes about and tells his friends that there is some one somewhere in the office who is prepared to listen to you, so go to him and unfold your story, he will help find a solution to your problem if it is at all possible. This message when carried through far and wide is in itself a great deed of courage, and we railwaymen should bear this simple fact in mind in our daily contact with colleagues and others.

How often have I thought of this simple truth and went into a reverie saying that if only we would care to listen to the wailings of thousands of workers, if only we would care to pay a little attention to the '*human touch*' which the Prime Minister is never tired of preaching, if only we would be prepared to spend a little time of our otherwise busy days in the act of

listening, how much alleviation of the sufferings of the "*ill-placed*" would be achieved.

Man is a rational being and he has the thinking faculty endowed on him; so if he exercises that faculty to the fullest extent, nothing can go wrong; if, on the other hand, it is allowed to get rusty and warped, then there is no hope for him. It is in this light that we should adapt our attitude towards co-workers and thus endeavour to discharge our duties in the best manner possible according to each one's light and lead.

Reverting to the topic of prayers, the best and the only prayer that I could think of is "*Oh God, lead me not astray, give me the courage and strength of mind to bear thy trials and tribulations, let me be true to myself*". How many of our railwaymen offer this prayer? Does it not connote the best in life and is it not the summon bonum of existence? What a tremendous strength is hidden in these words, which, if uttered daily in the sincerest feeling of a prayerful mood, will lead you to success in life.

The scribbling referred to earlier in this article may be substituted by this prayer and you may watch the result. You will find a decided change in your attitude to life and its workpile.



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Application should be made to the Station Master of your starting station at least 3 days in advance specifying the date and train by which you intend travelling and the tickets must be bought in advance. The reservation fee leviable is 8 annas per seat or berth.

Reservation by I and II Class from intermediate stations by Express trains can also be made similarly, but reservation ticket can be issued only after getting an advice from the Reservation Centre that the reservation has been made.

Tickets will be issued only if accommodation is available.

If the reserved seats or berths are not occupied at least 5 minutes before the booked departure of the train the reservation will be cancelled and the seat or berth given away to another.

Reservation fee is not refundable.

III Class seats are also reservable on Express and certain other important trains for long distance passengers from the train-starting stations on payment of a reservation fee of four annas per seat.

Do not occupy a berth or seat reserved for another, as you are liable to be displaced at the last moment.

If you find another person occupying the berth or seat reserved for you and if he will not vacate it on demand, report it to the Guard or Station Master. They will help you.

(Inserted in the interests of Travelling Public by the Public Relations Officer, Southern Railways Magazine)

August 1954

SOUTHERN RAILWAYS MAGAZINE

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(Continued from page 7)

Alexandra Palace to Finsbury Park will be closed from July 5. Passenger stations at Stroud Green, Crouch End, Highgate, Cranley Gardens, Muswell Hill and Alexandra Palace will close. The route will be covered by bus and tram services of London Transport already existing. It had been decided by the transport users consultative committee that the passenger service on this line was no longer justified since it was costing £3. 10. 0d to earn £1 in fares.

* * * * *

The Transport Minister, will shortly announce a much more generous and comprehensive pension scheme for railwaymen. The scheme had now been agreed, with the unions and it would include wages grades who up to now had not generally been covered. It was not intended to increase the pensions of men already retired.

* * * * *

British Road services are likely to remain in the haulage business on a much bigger scale than they planned. The failure of the road haulage disposals board to sell lorries and premises together means that the state will be left with thousands of vehicles, garages and offices on its hands. British Road Services originally planned to keep about 3,500 vehicles to compete with private hauliers. This figure was later amended to 4,500 giving the state the single biggest transport fleet in the country. The result of the latest sale shows that only 80 vehicles offered with premises were sold out of 1,018. The disposal board expected to sell to private firms 10,000 of the 32,000 state lorries. Actually, fewer than 5,000 have been sold. Hauliers have complained that prices are too high but vehicles offered without premises have sold better. Over 700 of 1,336 offered at the last sale found buyers. The unsold vehicles and premises will not be re-offered. Instead of this, plans for enlarging the state fleet are visualised.

* * * * *

The International Railway Congress was established in 1885. For the third time since its inception this year's meeting has been held in London. The first occasion was on the Association's tenth birthday in 1895, the second in 1925, the centenary of the Stockton & Darlington Railway. The object of the Congress is to facilitate the progress and development of railways by holding periodical congresses and by means of publications which include a monthly bulletin and a supplement "Electric traction

on the railways" which is published every other month. Both these publications are available in English and French. About 170 railways in all parts of the world, with a total mileage of some 290,000 miles, are affiliated. The only administrations which may be admitted to the Association beyond those who constituted it in 1922, are those whose principal business is the running of railways worked by mechanical traction, whether owned or leased by a public authority and having a length of at least 62 miles open for traffic. The Association is represented by a permanent commission which it elects and which has its seat at Brussels. Delegates to the Congress have an opportunity to present their views and those of the systems they represent in the form of papers. These, which are reproduced in English and French, are made available in advance for study and co-ordination, are the focal points for discussion at the daily sessions of the Congress. In this way an opportunity is afforded for prominent men from every important railway system in the world to meet and discuss their difficulties and to exchange information on the latest developments based on practical experience and research.

In connection with this year's meeting, British Railways staged an exhibition which was held in one of the engine roundhouses at Willesden Junction. Here the latest types of locomotives and carriages were placed on view and among the former were electric, diesel electric and diesel mechanical. The rolling stock of London Transport was also on view. On sidings outside the roundhouse were typical wagons of all kinds and civil engineer's permanent way vehicles. These included machines for laying pre-fabricated track, spillage cleaners for sidings, yard cleaners and ballast cleaners.

Among the electric locomotives was a 2,500 h. p. 1500v. D. C. six axle locomotive built to haul heavy freight and passenger trains on the Manchester-Sheffield-Wath electrification. These locomotives weigh over 100 tons and the control equipment is electro-pneumatic. The mechanical parts were built by British Railways and the electrical equipment by Metropolitan Vickers Electrical Co. Ltd. All the new British Railway's standard locomotives were exhibited including the giant Class 9F wheel classification 2-10-0, weight 139 tons 4 cwt. designed for working heavy mineral trains. A motor and trailer coach of the new rolling stock for the rehabilitation of the Lancaster and Heysham line was also on view. This is operated on 6,600 Volts 50 cycles which is probably the coming standard for electrification. Signalling and telecommunication equipment was also

SIGNALLING AND INTERLOCKING

By H. C. Towers, M.I.E.E., M.I.R.S.E., M.Inst.T.

Chapter 18. Route indicators.

THE function of the Home, Outer and Warner (or Distant) signals has already been explained in a previous chapter. In large yards, where a number of points have to be crossed, there are sometimes several Routing Home Signals, which come after the Home signal, these being necessary to secure the points through the mechanical interlocking in the cabin, if track circuits do not exist. Where track circuits are present only one Home signal is required with a route indicator underneath since the point levers are held by electric locks until the train has cleared the track circuits.

In the case of a station with four running lines on which trains can be received, without route indicators, there would be four home signals on a post or gantry. Some times the arms are all shown at the same height but generally the most important line has the highest arm and the less important the lowest. In large station yards it is quite common to find a signal gantry with eight or more Home or Routing signals. When these signals are operated mechanically a large and expensive structure is necessary and also the indication given is more difficult for the driver to observe.

In the route indicating system only one signal arm or colour light is used and the route set for the reception of the train is indicated by a number appearing beneath the signal arm. Where mechanical signalling is in use, Route Indicators can be operated mechanically the number being pulled into position by a wire. It is illuminated at night by means of an oil lamp.

The Sykes type route indicator exhibits the numbers in a circular aperture having clear glass in front and opal glass at the back. The numbers appear as a silhouette in daylight and are illuminated at night by an oil or electric lamp. A circular black disc obscures the aperture when the indicator is normal.

In the illustration, the normal disc is attached to the rod seen on the left and maintains the disc central in the circular hole in the case. The operating magnet, which rotates a Z type armature, can be seen on the extreme



Fig. 1.

Roller blind type route indicator.

left. The armature moves in an anti-clockwise direction when the coils are energised and this rotates a shaft. The furthestmost end of this shaft is connected by a link motion to the rod holding the normal disc. When the shaft rotates the disc moves downwards until it takes up a position corresponding with the numbers. Although

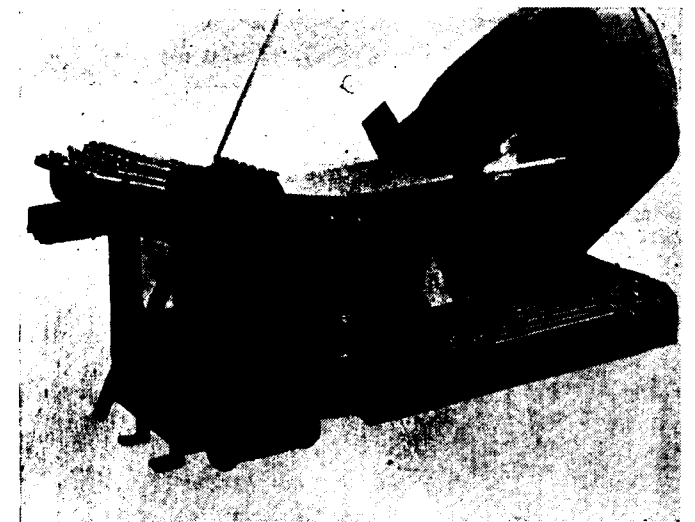
(Continued from page 19)

shown and miscellaneous engineering appliances, road vehicles, etc.

Where is the centre of London? From time immemorial it has always been considered as Hyde Park

Corner and many mileages are taken from this point. The Westminster City Council have selected the statue of King Charles I, on the south side of Whitehall and are designing a bronze plaque which will be let into the road near the statue to mark the central point exactly.

the shaft is rotated by the armature, no number can appear unless one of the selector coils are energised. These selector coils can be seen to the right of the main operating coil and are fixed beneath the rods holding the numbers. A quadrant shaped brass strip is fixed to the shaft and an attachment to the rod of each number bears on this quadrant by means of a roller. Each selector coil has a steel strip also connected to the rod attachment which slides along the top of the coil. The action is, on the operating coil becoming energised, if no selector coil is energised, the Z type armature rotates the shaft, the normal disc is moved downwards and all the steel strips move across the selector coils and no number appears, the amount of force required to move these strips being considerably less than lifting the number. If, however, one of the coils is energised, the armature at the bottom of the coil lifts a circular steel rod in a vertical direction which prevents the steel strip moving across the coils. On the rotation of the brass quadrant the steel strip being locked, the attachment to the rod is compelled to lift vertically which operates the rod and exhibits the number. This action being accomplished, a protrusion at the side of the armature open circuits a pair of economising contacts which leaves only half of the operating coils in circuit less magnetic



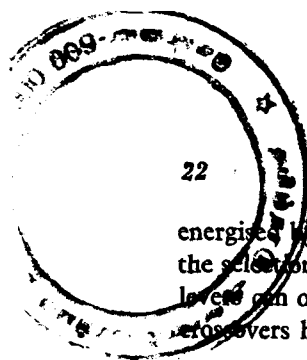
motive force being required in the holding position than for the initial torque. These springs can be seen at the top of the armature.

The position of the numbers can be electrically repeated in the signal cabin by means of the indication contacts two rows of which can be seen at the top extreme left. In this system the main operating coil is

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energised by the operation of the Home signal lever and the selection coils by the Routing levers. The routing levers can only be operated after the correct points and crossovers have been set.

Another type of route indicator displays white numbers on a black ground. It is worked on the roller blind principle the blind being wound by an electric



Multi lamp or theatre type route indicator.

motor which is at the lower position of the case. The blind is stopped at the number required by a special selective arrangement over the motor. This is operated in a manner similar to that of the Sykes Indicator each route having a separate selection wire.

The optical type indicator consists of a ground glass screen and the number is projected on to this screen from inside the case. Each indication consists of a separate lamp unit contained in a circular case. The lamp, when illuminated, projects a beam through a figure stencil and lens on to the ground glass screen. These lamp units

(Continued on page 23)

August 1954



Junction Indicator Signal at Mahim, Western Railway, India.

are arranged in a circumferential manner inside the case. The lamps are energised from the route indication lines coming from the signal cabin and the operating voltage is usually 110. The lamps are energised at 12 Volts each lamp having its own transformer inside the route indicator case.

The theatre or multi lamp type route indicator consists of a square bank of electric lamps and certain lamps are energised so as to take the shape of the figure required. A relay is used for each indication and this relay energises the number of lamps required to produce the indication. This indicator is called the theatre type because it was used extensively in variety theatres for displaying the item number on the programme. One of these indicators was placed each side of the proscenium opening just above the orchestra pit.

The route indicators described are intended for use on Home signals approaching terminal stations or junctions. Here the train speeds are necessarily slow and

August 1954

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THE BRITISH RAILWAYS TODAY

By Ernest Chisholm Thomson

Divided into six regional zones, British Railways today form a vast network over the whole country with a total of over 53,000 miles of track. They own over 20,000 locomotives and 42,000 passenger vehicles, and carry annually some 1,500,000,000 passengers and 285,000,000 tons of freight. The frequency of services, the low price of travel, and the large number of non-stop runs are some of the outstanding features of rail transport in the United Kingdom.

As a train enthusiast I enjoyed a secret thrill the other afternoon on discovering that the best-paying sideshow in the spectators' enclosure at London Airport was a model railway. To left and right of us there were "Constellations", "Viscounts", "Elizabethans" and other aircraft touching down from the ends of the earth, or taking off to them in breathtaking succession. Yet, to judge by the queues of customers for railway rides, the gaily-coloured little trains might have been the greatest transport wonder of the age.

Can it be that, in the country which pioneered rail transport more than 150 years ago, we have railroads in the blood? That the iron road still holds an irresistible fascination there can be no doubt. And this despite the fact that nationalisation of the railways threatened to rob them of romance.

Unification of the different systems looked like the shedding of their individuality. The best news for railway fans this summer has been of the Transport Commission's new plan, soon to be submitted to Parliament, for restoring an increasing measure of autonomy among the various Regions. This would mean, among other blessings, a return of distinctive colouring for engines and rolling-stock. There was a time when each railway—the Great Western, the Southern, the London Midland and Scottish, the London and North Eastern—was permeated with the same *esprit de corps* as a military regiment. Their characteristic colours—red for the Midland, green for the Great Western, and so on—rallied supporters like the banners of an army. Even now the Regions are strong entities with their own loyal supporters; for millions the sight of a "crack" express on their favourite railway brings a glow never inspired by a road coach or even a helicopter.

(Continued from page 22)

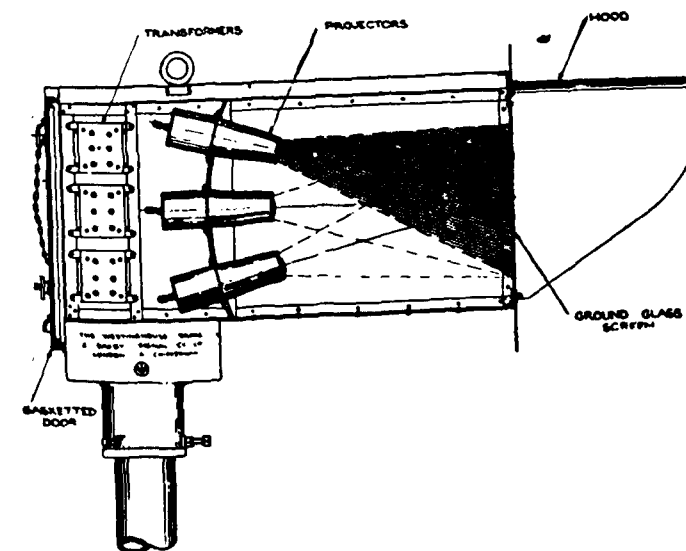


Diagram of optical type route indicator.

there is no difficulty in observing the route displayed. They are not satisfactory where trains are switched from one track to another at high speeds and until recently separate signals had to be used to provide the indication. The position light junction indicator has since been

introduced to overcome this difficulty. The principle of operation is as follows. One signal only is employed and immediately above it are groups of lunar white lights. There are three or four lights for each route and each lens is five inches in diameter. If the points are set for the straight line the green aspect of the signal is illuminated and no indication appears on the junction indicator. If the points are set for a left hand route the 45 degree indication leaning to the left is illuminated also the yellow aspect of the signal. If there is a second diversion to left or right the white lights are arranged horizontally. The indicator lens is provided with deflecting prisms to give a close up indication in addition to the main beam. 12 Volt lamps are used energised from 110/12 Volt transformers. This type of indicator avoids the use of unnecessary red lights at high speed junctions. It has been found that at night, three or more colour light routing signals are placed together, the halation from the red aspect has a tendency to obscure the yellow or green aspect of a signal in the same group. The junction indicator overcomes this difficulty and this type of signal is now extensively used on the British Railways.

(To be continued)

RECORD RUN

Railways are definitely in the news. Disciples of Eastern Region are jubilant over the record run of the new "Elizabethan" service which has just cut the timing from London to Edinburgh to six-and-a-half hours. Drawn by the locomotive "Union of South Africa", it became the first train to undertake a daily scheduled non-stop journey of roughly 400 miles at more than 60 miles an hour from start to finish. This, by the way, will be acceptable news for thousands of visitors to Britain for the famous Edinburgh Festival of Music and Drama opening on August 22. Over long stretches the trains reach 90 miles an hour.

On shorter journeys at least ten expresses this summer are averaging well over 60 miles an hour from start to stop, easily the greatest mile-a-minute mileage operated by steam in any European country.

Among the main lines a premier place has always been held by the Great Western (now Western Region), which serves Wales and the West of England. This July has seen the 50th anniversary of the start of its renowned Cornish Riviera Express, running daily from London to Plymouth, Devon, and on to the "toe" of Cornwall. As long ago as July 1904 it was covering the 245 miles to Plymouth at an average speed of over 55 miles an hour. It spins effortlessly over some of the best speed stretches in Britain like a greyhound on ball-bearings.

CENTENARY CELEBRATION

Incidentally, the wonderful track on this route was originally laid more than a century ago by Isambard Kingdom Brunel, one of the world's greatest railway engineers. We have just celebrated the centenary of his Paddington Station, that epitome of 19th century dignity, which he built as the London terminus of the Great Western Railway. But Brunel's versatility ranged beyond railways. In 1838 he constructed the "Great Western", the first steamship to cross the Atlantic; 20 years later he followed it with the fabulous "Great Eastern" then by far the biggest ship in the world.

No student of transport history will forget Brunel and his contemporaries when tributes are paid to Britain's close-knit railway network. Tribute was paid the other evening in a broadcast by Sir Alexander Maxwell, chairman of the British Travel and Holidays Association. He said that overseas visitors show amazement at the frequency of the railway services, the low price of travel, and the number of non-stop runs. Sir Maxwell speaks with authority; his organisation keeps close check on tourist movements and has just reported that 260,000

guests from overseas came to Britain in the first five months of this year. Although there is not the attraction of the Coronation, the figure is only one per cent. below that in the corresponding period last year.

If British Railways needed outside encouragement they certainly got it recently when delegates from 30 countries descended on London for the 16th International Railway Congress. No such gathering of railroad folk had been seen in Britain since 1925. They came from all parts of the Commonwealth, from Europe, the Near East and Asia. Our railways were "at home" to them in the historic locomotive sheds at Willesden, in the London suburbs. Some of us laymen were privileged to join them in examining the latest locomotives, carriages, wagons and signalling devices.

NEW TRADITIONS

The star exhibit was prototype locomotive No. 17,000, "Duke of Gloucester", a 12-wheeled giant introducing new traditions in engines for working heavy passenger trains at express speeds.

Will No. 17,000 be the last word in steam traction? Electrification is gaining ground and more and more diesel trains are making their appearance. The British Transport Commission is spending £2 million on light-weight diesel services in the North of England.

Lovers of steam railways take these innovations philosophically. What really shook us, however, was a letter in the "Times", London, the other day suggesting that our railways should be converted into roads. As Queen Victoria once remarked: "We are not amused."



"It's a most peculiar complaint—a severe pain in my left side which comes on after meals."

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All Railwaymen should set an example of cleanliness. This will help others and themselves.

WESTERN RAILWAY

IN YOUR OWN INTERESTS HOW TO PURCHASE TICKETS

Buy your tickets only at the proper place. The authorised offices are (i) the Booking offices at the railway stations, (ii) the Town or City Booking Offices, (iii) the out-Agencies, (iv) Travel Agents. Never buy tickets from any other source as that may lead you to trouble. Please note that tickets are not transferable.

Buy your tickets in the proper time. You can avoid unnecessary excitement and trouble if you come to the station in good time, that is at least half an hour before the scheduled departure of your train. The Time Tables of the Railway are on sale at Booking Offices and Bookstalls.

Buy your tickets in the proper manner. Queue up at the Booking Window and you can get your ticket easier and quicker than by crowding at the counter.

By handing in the exact fare in good coins or currency you get the ticket easier and quicker, and save for yourself and the Booking Clerk time and trouble.

Check up your ticket and money before leaving the counter and draw the attention of the Booking Clerk to any discrepancy you may notice.

(Inserted in the interests of Travelling Public)