M.R.O. 1—77,006—9-6-37.

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MADRAS RECORD OFFICE.

Government of Madras.

Public works DEPARTMENT.

G.O. No. 3078 Press Mis.
393-94
Dated 17-12- 1870.

Not to be folded or roughly handled

No. 393. Read the following Circular from the Under-Secretary to the Government of India, Public Works Department, (Railway,) to the Governments of Madras, Bombay, Bengal, the North-Western Provinces and the Punjab; the Chief Commissioners of Oudh, Central Provinces, British Burmah and Mysore and Coorg; the Resident at Hyderabad; and the Agent to the Governor-General for Central India, dated Fort William, 19th November 1870, No. 19-R. :—

THE undersigned is directed to forward for information copy of a Memorandum by Captain Tyler, R.E., Inspecting Officer to the Board of Trade, on the subject of Railway signals and Railway breaks.

(Signed) A. H. VAUX,
Under-Secy. to the Govt. of India.

Memorandum by Captain H. W. TYLER, R.E., on No. 824—1,235 R, regarding Railway signals and breaks, dated 16th May 1870.

THE Indian Government ask in this paper for information on two subjects—

1.—Locking apparatus as applied to points and signals.

2.—The application of continuous breaks to trains.

The system of interlocking points and signals first found to be necessary for the safe working of Railway junctions, and now coming into extensive employment for Railway stations also, has proved by experience to be, when properly applied, a valuable means of preventing Railway accidents.

Without the use of a locking apparatus, it is always possible, wherever there are conflicting or alternative signals, for a signalman to make a mistake in the working of those signals, and wherever there are facing points in connection with signals for a pointsman to hold a pair of points in the wrong direction, or partly so, at the same time that the signalman exhibits an all-right signal to a train, or for a signalman (if he works the points also) to leave the points in a wrong position while he lowers the signal for the passage of a train. When, again, there are facing points unconnected with signals, a simple mistake of a pointsman may, at any time, cause an accident of a more or less serious character.

The constant occurrence of accidents from these causes has led to numerous recommendations and requirements by the officers of the Board of Trade, under which very perfect arrangements for interlocking points and signals have at length come into general use. Experience shows more and more the necessity for it, and the expense of the apparatus is trifling as compared with the immunity from accident which it affords; so that it is at length seen to be desirable that every facing point on every line of Railway should be interlocked with a signal, or with signals, and that no two signals which can conflict with one another should be unprovided with locking-gear. The points may be left free for shunting purposes while the signals are at danger, but should be locked in the proper direction when any signal applying to them is lowered for the passage of a train. No obstruction need therefore be placed in the way of shunting operations by the adoption of this means of safety. In India, where so much may be saved in the cost of working by the employment of native in the place of European servants, such mechanical

means of preventing accidents from ignorance or carelessness will probably be more important than in this country. On the other hand, as speed is increased, as traffic grows, and as stations and junctions become more complicated, so the necessity for guarding in this way against accidents becomes more urgent; and the mode of conducting traffic in England, which is different from that of every other country (in the frequent running of the trains for goods as well as passenger traffic, and the complicated character of the arrangements for facilitating ingress and egress at stations, with trains constantly crossing each other's paths in different directions) have forced upon the English Railway Companies improvements of this description which have hardly gained a footing on the Continent or in America.

As regards the different systems of locking apparatus, or rather the different modifications of the system which have been adopted on the various English Railways, the names may be mentioned of Messrs. Saxby and Farmer, Messrs. Stevens and Co., Messrs Vickers and Co., Messrs. M'Kenzie and Co., and those of the Midland Railway Company and the Great Western Railway Company; and various improvements have been proposed or carried out from time to time by Mr. Anderson, Mr. Brady, Messrs. Livesey and Edwards, Mr. Easterbrook, and others.

I enclose drawings and descriptions of some of the apparatus, and Messrs. Saxby and Farmer state that they would be happy to forward a model to the India Office, or to India, or a full-sized apparatus, to be fitted up at any station or junction there if so desired, and to construct it, as an example, at their own expense. They would, of course, require a detailed plan and description of the locality in constructing such apparatus. They have generally done their work very well in this country, and would probably be as well, if not better, able to undertake Indian work as any other Firm, and it is their speciality. But they have been in the habit of charging high prices, in which the competition of later years only has caused a reduction, and it will be necessary to make arrangements with them in this respect.

There has been much litigation from time to time in regard to the patent rights for locking apparatus, and the system of the Midland Company has been designed and improved upon from time to time with a view of avoiding the payment of such rights. But it has not attained the same degree of perfection as those of the manufacturers before referred to.

As regards continuous breaks on Railway trains, a great number of systems have been tested from time to time, some of them self-acting, others to be applied solely by the guard, and others to be applied at pleasure by the guard, or the engine-driver. It is an obvious advantage to place the control of the whole train in the hands of the engine-driver, so long as the guard also has the means of applying a suitable proportion of break-power. In the event of accident to the leading or middle portion of a train, it is important that a guard in the rear should at any time be able, by keeping the couplings stretched, to prevent the trailing portion from over-running a disabled vehicle or disabled vehicles towards the front. And in the event of a coupling failing while a train is running, it is important, especially on, and in proportion to the steepness of a rising gradient, that a guard in the last vehicle should have the means of controlling such vehicles as may be detached from the remainder.

Proceedings of the Madras Government, Public Works Department,
17th December 1870.

These objects may, of course, be more or less attained by increasing the number of the guards and of break vehicles in the trains, and by adopting the system, universal in America, and much practised in Europe, of enabling the guards to apply the breaks of more than their own vans. In America, each conductor or guard can, in moving through an internal passage throughout the train, work a break handle at either end of any vehicle in it. In some parts of the Continent of Europe, a breaksman, accommodated with a raised seat on a carriage, is able to apply the break of that carriage and the one adjacent to it.

But when continuous breaks are employed, a greater amount of break-power can be applied, within a shorter period of time, by a smaller number of guards, and thus efficiency is combined with economy, while there is an important gain of time, when seconds may be a question of life or death.

Of the systems of continuous breaks, those which have been most successfully employed are the breaks of—

Mr. Newall, principally on the East Lancashire Section of the Lancashire and Yorkshire Railway.

Mr. Fay, principally on the Lancashire and Yorkshire Railway.

Mr. Clark, principally on the North London Railway.

The breaks of Mr. Newall and Mr. Fay are somewhat similar except that Mr. Newall's break flies on with a spring on the release of the handle, while Mr. Fay's break is applied by the guard. They both operate by means of shafting and joint couplings, and they may be applied by one guard to three or four vehicles.

The break of Mr. Clark, or, as it is now called, of Messrs. Wilkin and Clark, is a chain break, and it may be applied to a greater number of carriages. A ratchet-wheel is operated upon by an eccentric-wheel running on the revolving-axle, and the eccentric wheel is kept clear of the axle until the break is wanted.

I forward herewith drawings and descriptions of these breaks, and shall be happy to give any further information on this or other subjects that the Indian Government may require.

No. 394. ORDER THEREON, 17th December 1870, No. 3,078.

RAILWAY, No. 36.

COMMUNICATED to the Consulting Engineer for Railways.

(True Extract.)

Colonel, R.E.,

Secretary to Government.

To the Acting Consulting Engineer for Railways.

Exd. E. C. Shunker.

All communications should be addressed to the Secretary

CIRCULAR No. 19 RAILWAY.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

RAILWAY.

To

GOVERNMENTS OF MADRAS, BOMBAY, BENGAL, THE NORTH WESTERN PROVINCES AND THE PUNJAB; THE CHIEF COMMISSIONERS OF OUDH, CENTRAL PROVINCES, BRITISH BURMAH AND MYSORE AND COORG; THE RESIDENT AT HYDERABAD; AND THE AGENT TO THE GOVERNOR GENERAL FOR CENTRAL INDIA.

FORT WILLIAM, NOVEMBER 19, 1870.

The undersigned is directed to forward for information copy of a Memorandum by Captain Tyler, R. E., Inspecting Officer to the Board of Trade, on the subject of Railway signals and Railway breaks.

Lepel H. Vance

Under Secy. to the Govt. of India.

To

The Secretary to the Govt. of Madras,
Public Works dept. (Railway)

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

RAILWAY.

To

GOVERNMENTS OF MADRAS, BOMBAY, BENGAL, THE NORTH WESTERN PROVINCES AND THE PUNJAB; THE CHIEF COMMISSIONERS OF OUDH, CENTRAL PROVINCES, BRITISH BURMAH AND MYSORE AND COORG; THE RESIDENT AT HYDERABAD; AND THE AGENT TO THE GOVERNOR GENERAL FOR CENTRAL INDIA.

CIRCULAR No. 19 RAILWAY.

Dated November 19, 1870.

Received 29th ——.

Forwards for information copy of a Memorandum by Captain Tyler, R. E., on Railway signals and Railway breaks.

P. W. D. Press—19-11-70—220.

G. C/-4829

Govt. of {1870} Madras.

PUBLIC WORKS.

To Rec'd by Committing Engr for Railways

No. 1.

No. 2.

G. O. 17th Decr 1870. No. 3078

Nos. 6731 & 34

Railway Signals and Breaks.

Circular from the Govt of India
forwarding Copies of Mems:
by Capt. Taylor R.E., on Railway
Signals and Breaks, and of
the Regulations for Railways.