Dispatching Installation at Paris Gare du Nord

G. FRYDBERG, SOCIÉTÉ DES TÉLÉPHONES ERICSSON, COLOMBES

The lines of the French Chemins de Fer du Nord constitute one of the largest railway systems in France. It connects Paris with the great mining and industrial regions of Northern France and with the Channel ports. The system also serves suburbs of several million inhabitants. It follows that effective supervision at the Gare du Nord in Paris is of the greatest importance for the regular operation of the services. In 1933 the Chemins de Fer du Nord entrusted Société des Téléphones Ericsson with the design and installation at the Gare du Nord of a dispatching system with the object of operating and, by immediate notification in case of faults, supervising the movements of trains through a special office in telephone communication with stations, signal cabins and locomotive sheds. The installation was put into operation in May 1934.

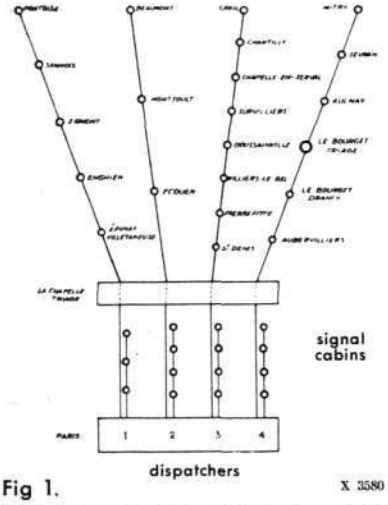

Fig 1. X 3580
Diagram of the Gare du Nord dispatching system

The dispatching system, Fig. 1, comprises four station lines and four signal-cabin lines. Each of these eight lines consists of two conductors to which telephone instruments are connected in parallel; in no case is earth used as return conductor. During the periods of the day when traffic is small the circuits of the dispatching system are utilised by the accounting department of the railway. This has an instrument at la Chapelle-Triage and another at le Bourget-Triage on the Paris-Mitry line.

Operation

The dispatching system is worked in two different ways: *regulation*, when the dispatchers do not listen-in at the instruments continuously; *control* when they are listening-in without break. For regulation a dispatcher deals with several lines, usually all four. He marks up minute by minute a diagram of the situation at the platform tracks at the Paris station. At suburban stations and the signalcabins the responsible employee must call the dispatcher

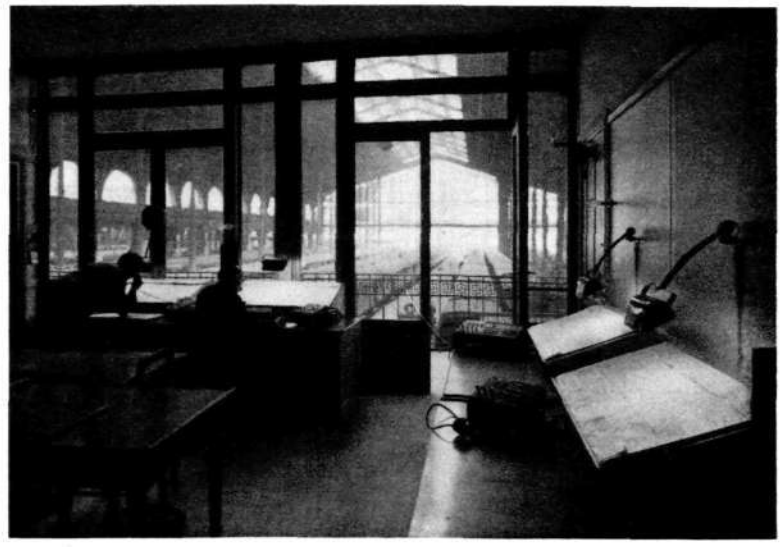

Fig. 2 X 5290
Dispatching office at Gare du Nord

Fig. 3 X 3614
Central apparatus for dispatcher

Fig. 4 X 3581
Central apparatus for special dispatcher

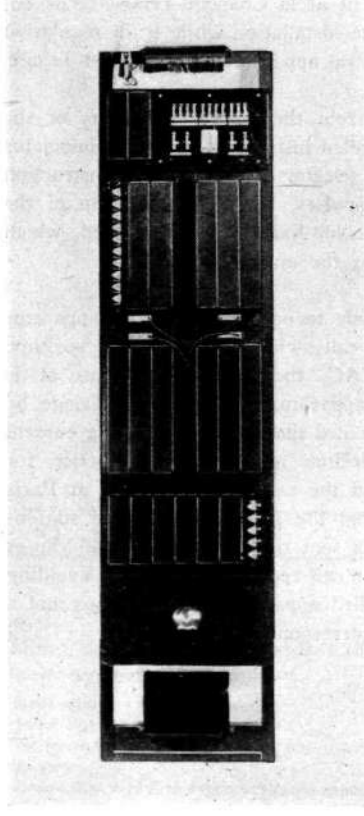

Fig. 5 X 3582
Relay rack

immediately anything unsual occurs, *e. g.*, a fault or something causing same, delays of more than three minutes, alterations in the movements of trains or locomotives, defects in the shunting devices, briefly, anything that may affect the regular handling of traffic. Train regulation is normally in operation from 6 a.m. to 9 a.m. and from 5 p.m. to 8 p.m. on weekdays, and from 6 a.m. to 9 a.m. and from 11 a.m. to 2 p.m. on Saturdays. In addition to these times the chief dispatcher at Paris may put regulation into operation at other times. In that case he sends out a general call to all the instruments connected to the line he wishes to supervise. When all these have answered he declares »regulation in operation until further notice». The responsible employees then make arrangements for advising the dispatcher of any troubles. Should anything occur outside the hours of operation the employee who notices the incident should advise the dispatcher of same over the telephone instrument of the system. The dispatcher then decides whether it is necessary to put train regulation into operation.

Control is put into operation in case of serious interruption on a line and Paris then allots a special dispatcher to that line. The same thing is done when traffic is particularly heavy, such as the eves of holidays, the days following holidays, race days, etc. Two, three or four such special dispatchers may work in collaboration. The dispatcher in Paris marks up a diagram of the actual traffic over that line for one direction or the other or for both directions, according to the circumstance. Independent of this another employee makes a diagram of the situation at the Gare du Nord station tracks. To put train control into operation a general call is sent out from the Gare du Nord and when all instruments have answered notice is given »line ..... will work under control in ..... direction». From that moment an employee at each station communicates over the dispatching system telephone each passage, arrival or departure of a train. The same applies to the signal-cabin staffs.

In addition to this telephoning of traffic on certain lines, the responsible employees at the stations must advise the dispatcher at Paris of all unusual happenings, as in the case of regulation. When control is in operation the dispatcher is continuously connected and the station and signal-box staffs have no need to ring up by the magneto when taking up the receiver. Use of the magneto is only necessary if the dispatcher does not reply.

Construction

Fig. 2 shows the interior of the dispatching office. The four desks corresponding to the four stations and the four signal-cabin lines may be seen on the illustration. On the central apparatus, Fig. 3, may be seen, to the right, the buttons for calling stations and signal cabins in the suburbs. The black button at the bottom right hand corner is used for general call. To the left are the switches for connecting up the four station lines and the four signal-cabin lines. These switches each have a position for connecting up the lines to the three other apparatus, see Fig. 4. Over each switch are two call lamps connected in parallel, one acting as reserve. The row farthest left contains a switch which joins up the four signal-cabin lines so that they can be operated simultaneously. This row contains in addition at the top a key for testing the reserve signal current delivered by a converter. The accounting-department central apparatus at la Chapelle-Triage is arranged in the same way as that at the Paris station.

Relays and other devices are mounted on a rack, Fig. 5. The four relay sets in the middle form the four impulse emitters, one for each regulation station. Below that is a call relay set, and at the bottom, protected by a cover, the converter which supplies reserve for the ringing current. At the top of the rack there are fuses and connecting terminal.

Fig. 6 X 3584
Central apparatus for twenty positions

Fig. 7 X 3583
Central apparatus for two positions

The central apparatus at le Bourget-Triage, Fig. 6, is fitted with a dial with twenty positions, with a magneto as reserve current supply. The apparatus at the other stations, Fig. 7, contains two switches for call by magneto to one of the other two central apparatus. On the upper part of the apparatus there are a bell with cover, a lamp and an annunciator. The selector and other devices are mounted inside the apparatus on a frame which can be swung out.

Functioning

The dispatching apparatus at Paris calls the stations and the signal cabins by selective call and with current from the 120 V, 50 c/s, mains. In case of failure of the mains a converter comes automatically into work. This converter is fed by the 24 V battery in the telephone installation at the Gare du Nord and likewise delivers 120 V, 50 c/s. The dispatcher in Paris may call each station or signal cabin individually, or send out a general call over two or more lines simultaneously. To call a station or signal cabin the dispatcher presses the corresponding call button for an instant, after pulling down the switch corresponding to the called instrument's line. The impulse emitter then sends out the corresponding number of impulses, following which current is fed for about 6 s, during which time a bell rings and a lamp lights at the called instrument. The disc of the annunciator falls at the same time so that the called employee can see there has been a call even if he did not hear the bell. When the bell rings the dispatcher hears answering tone. The dispatcher may, if desired, prolong the call by keeping the call button pressed until the called employee replies whereupon the answering tone ceases. This is of particular utility in case of general call: cessation of answering tone then indicates that all instruments have answered. The impulse emitters are fed in the same way as the converter by the 24 V battery in the telephone installation at the Gare du Nord.

The apparatus of the accounting department at la Chapelle-Triage sends out calls in the same way, but may not use the installation while train regulation is in progress. The same applies to the central apparatus at le Bourget-Triage.

Call from the train dispatcher or also from the central apparatus of the accounting department is signalled at the called instrument by bell, annunciator and lamp. These devices are operated by a selector of very strong construction which is governed by the call current impulses. By the lighting up of the lamp the call is indicated even if the receiver has not been replaced, which interrupts the ringing current and restores the annunciator disc.

From a station or signal cabin call is made to one of the central apparatus by turning the magneto after putting the call switch into the right position. The dispatcher at Paris is called by AC, the central apparatus at le Chapelle-Triage by DC and the central apparatus at le Bourget-Triage by DC but of opposite polarity. It should be noted that the 30 V ringing current from the stations cannot actuate the selectors as these only function for selective call at 120 V. On the other hand the call receiving relay at Paris is actuated only by generator current from the instruments at the stations or signal cabins. The 120 V AC which is sent out for selective call causes the energizing of a relay which cuts out the call receiving relay, thus avoiding false call. The call is indicated on the called apparatus by two lamps and a buzzer. Answer is made by moving the corresponding switch.