



ANTWERP CENTRAL STATION.—Block Train for Brussels, 5 8-Wheeled Bogie Coaches and 2 6-Wheeled Brake Vans, with rounded ends, headed by "Dunalastair" type Locomotive, C. de F. de l'Etat Belge. Photo Loco. Pub. Co. Ltd.

**BELGIAN EXPRESS TRAINS IN 1910.**

THE Kingdom of Belgium does not afford its railways much scope for a display of high speed running. It is a densely populated country and on the level portion which may be taken roughly as north and west of the line through Charleroi, Namur and Liège, important towns occur with such frequency that long runs are out of the question. On the mountainous south-eastern portion the heavy grades prohibit anything but a moderate speed being attempted. Nevertheless the treatment accorded by the administration of the Belgian State Rys. leaves little to complain of, a very liberal service at a fair speed and low fares being provided, whilst practically all the main line trains are formed of comfortable steam-heated corridor carriages, and a restaurant car is attached to many of them.

The two most important trains are the International ones known as the "Nord-Express" and "Ostend-Vienna-Express" respectively, which leave Ostend Quay at 15.32 and 16.46 (hours in Belgium being reckoned from 1 to 24) in connection with the 9.0 a.m. service from Charing Cross. The Nord Express affords communication with Cologne, Hanover, Berlin, St. Petersburg, Moscow and Siberia, whilst the Ostend-Vienna Express connects with Frankfurt, Munich, Trieste, Vienna, Budapest and Con-

stantinople. These trains are formed exclusively of the restaurant and sleeping cars of the Compagnie Internationale des Wagons-Lits, both run *via* Brussels and are timed over the Belgian State Rys. as follows:—

Kilom.	Miles.			Nord Express.	Ostend-Vienna Express.
		Ostend Quay .. ..	.. dep.	15.32	16.46
122	75½	Brussels (Nord) .. ..	.. arr.	17.12	18.24
		" .. ..	.. dep.	17.22	18.38
152	94	Louvain .. ..	.. arr.	17.50	—
		" .. ..	.. dep.	17.52	—
216	134	Ans .. ..	.. arr.	18.45	19.53
		" .. ..	.. dep.	18.47	19.55
222	137½	Liège .. ..	.. arr.	18.58	20.6
		" .. ..	.. dep.	19.13	20.11
248	154	Verviers (Est.) .. ..	.. arr.	19.48	20.46
		" .. ..	.. dep.	19.49	20.47
260	161½	Herbesthal .. ..	.. arr.	20.7	21.5
		Time on journey .. ..	..	4 hr. 35 m.	4 hr. 19 m.
		Time at stations .. ..	..	30 m.	22 m.
		Running time .. ..	..	4 hr. 5 m.	3 hr. 57 m.
		Average inclusive speed per hr. . .	..	56.7 k. (35.2 m.)	60.6 k. (37.6 m.)
		Average running speed per hr. . .	..	63.7 k. (39.6 m.)	65.8 k. (40.9 m.)

On the return journey the timings are somewhat similar, but both trains call at Welkenraedt for customs examination and the Nord-Express makes no stop between Liège and Brussels, completing the journey in 4 hr. 19 m., the running time being 3 hr. 54 m., representing speeds of 60.6 kilom (37.6 m.) and 66.7 kilom (41.4 m.) per hour respectively. The corresponding figures for the Ostend-Vienna-Express are 4 hr. 38 m. and 4 hr. 3 m., equivalent to speeds of 56.1 kilom



(34.8 m.) and 64.2 kilom (39.9 m.) per hour respectively. Notwithstanding the heavy rolling stock of which the trains are formed and the comparative shortness of some of the runs it must be admitted that these speeds are somewhat low when compared with British standards. Higher speeds are however to be met with on some of the purely Belgian trains, and the following is a list of the runs performed at an average of 75 kilom per hour and upwards:—

No. of runs.	Kilom.	Mins.	Speed per hour.	
			Kilom.	Miles.
1 .. Gand (St. Pierre) and Bruges ..	41	29	84.8	52.6
4 .. Antwerp (Central) and Malines ..	24	18	80.0	49.7
9 .. Gand (St. Pierre) and Bruges ..	41	31	79.3	49.2
2 .. Malines and Louvain ..	25	19	78.9	49.0
26 .. Brussels (Nord) and Antwerp (C.) ..	44	34	77.7	48.3
1 .. Ans and Brussels (Nord) ..	94	73	77.2	48.0
1 .. Bruges and Gand (Sud) ..	45	35	77.1	47.9
1 .. Brussels (Nord) and Ostend Quay ..	122	95	77.0	47.8
1 .. Alost and Bruges ..	68	53	77.0	47.8
5 .. Gand (St. Pierre) and Bruges ..	41	32	76.9	47.7
1 .. Gand (St. Pierre) and Ostend, Ville ..	64	50	76.8	47.7
1 .. Ans and Brussels (Nord) ..	94	74	76.2	47.3
1 .. Ostend Quay and Gand (Sud) ..	68	54	75.5	46.9
1 .. Ostend Quay and Gand (St. Pierre) ..	64	51	75.3	46.8
2 .. Brussels (Nord) and Ans ..	94	75	75.2	46.7
1 .. Bruges and Gand (Sud) ..	45	36	75.0	46.6
4 .. Malines and Louvain ..	25	20	75.0	46.6

62 Total number of runs at 75 k. p.h.

The 34-minute trains between Antwerp and Brussels run about every hour from either end and consist of seven vestibuled corridor vehicles which rank among the best in Europe. They are electrically lighted and are almost invariably hauled by one of the Etat Belge four-coupled bogie express locomotives of the Caledonian Ry. type, as shown in the illustration on page 217.

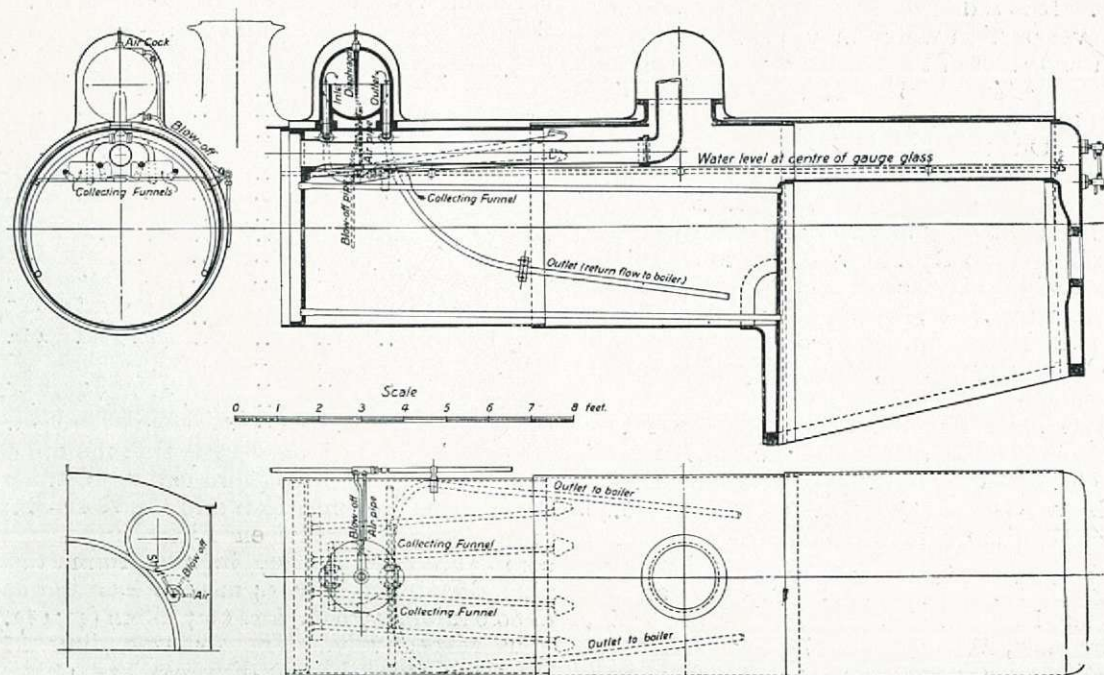
For the reasons already given very few non-stop runs of any considerable length are to be found in Belgium, and the following list comprises those of 80 kilometres and upwards:—

No. of runs.	Kilom.	Miles.
5 .. Brussels (Nord) and Ostend Quay ..	122	75½
4 .. Brussels (Nord) and Liege ..	100	62
5 .. Brussels (Nord) and Bruges ..	99	61½
1 .. Liege and Malines ..	95	59
9 .. Brussels (Nord) and Ans ..	94	58½
2 .. Alost and Ostend, Ville ..	91	56½
1 .. Jemelle and Kleinbettingen ..	90	56
2 .. Antwerp (Central) and Hamont ..	88	54½
2 .. Brussels (Midi) and Feignies ..	80	49½

The foregoing particulars refer exclusively to the trains of the Belgian State Ry. system. None of the railways now remaining in private hands make any attempt at running express trains with the exception of the Nord-Belge, which works through Belgian territory the through trains from France to Charleroi, Namur and Liege. The running is somewhat disappointing, however, considering the comparatively easy course traversed. The longest and fastest run on this system is from Namur to Liege, Guillemins, 60 kilos, which is performed by one train in each direction daily in 50 mins., equivalent to a speed of 72 kilom (44.7 miles) per hour.

**THE "HOTCHKISS" CIRCULATOR.**

IT has long been recognised that thorough circulation of the water in a boiler provides one of the best means of preventing the troubles consequent on the use of impure water and of increasing the boilers efficiency. If in conjunction with this circulation there are means



THE "HOTCHKISS" CIRCULATOR APPLIED TO A LOCOMOTIVE BOILER.