

The machine illustrated is also designed for drilling the plates and is so shown in Fig. 3, and it is often an advantage to have both operations performed in such a way, thereby saving the cost of a second expensive machine and much shop room; moreover, except in the case of a few large works, the output would not keep the two employed.

The illustrations, which have been kindly supplied by the makers, give a very clear idea of the design, and the arrangement of the main drives and feed motions. Attention may, however, be drawn to a few leading features; and taking first the various feed motions for the slotting head it will be seen how conveniently they are operated by means of the clutch levers shown in Fig. 3. These feeds are, of course, intermittent, and are effected, when the ram is being reversed just before the commencement of each cutting stroke, by means of a cam raising a lever which in turn, by a pawl, rotates a ratchet wheel through a small portion of a revolution; this ratchet is keyed on to a lead screw passing inside the cross slide, and motion can be imparted either to the saddle by means of a nut on the latter, or, through two vertical shafts, to the whole carriage; the vertical shafts being provided with mitres which gear with two others forming nuts on the leading screws at the base: all these details can be readily followed in Figs. 1 and 3, and the banjo frame will also be noticed carrying the gear wheels which require changing for varying the feeds.

Taking next the drilling spindle, which is of hard steel and balanced, the feed motion for this is continuous and positive through cut gear and cut steel pinion and rack which can be instantaneously changed whilst in motion.

Another feature of the design is that, when arranged for a belt drive, as well as an electric one, the motion is entirely positive, and so obviates any irregularities of speed through slipping of subsidiary belts and other friction gears. Fig. 2 gives a back view of the slide illustrated in Fig. 3 and shows how conveniently the machine may be arranged for a motor drive.

In conclusion it may be remarked that the machine is of substantial proportions and of ample strength and, the workmanship throughout being accurate and reliable, it is in every respect suitable for the work it is intended to perform.

MR. PERCY LINDLEY has once more published an interesting brochure for the Great Eastern Ry., entitled "East Coast Holidays," in which special prominence is given to some of the less known districts of East Anglia and to the country between the Cromer coast and the Norfolk Broads. The little book is tastefully and well illustrated, mostly in colours, and has several excellent maps.

WEST FLANDERS RY. LOCOMOTIVES.

By ALFRED ROSLING BENNETT.

THE passing of the West Flanders Ry., a very successful British enterprise, into the hands of the Belgian State Rys., which took place on 1st July, 1907, renders an account of the interesting engines that were still extant on the line at the date of transfer desirable.

The West Flanders Ry. Co., Ltd., originated in 1845, when a concession was obtained to construct a railway from Bruges to Courtray, Ypres and Poperinghe. In 1864 an extension from the latter place to the French frontier was made, and under a concession from the French Government the line was carried to Hazebrouck, in French Flanders, where it effected a junction with the Northern of France Ry., to whom, for the use of Hazebrouck Station, an annual sum of £3,200 was agreed to be paid. In later years further

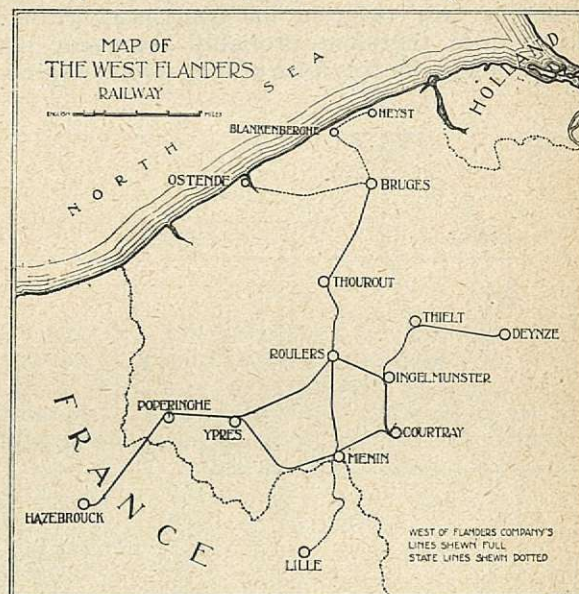


FIG. 1.

extensions took place to Thielt and Deynze, and Roulers was linked both to Ypres and Menin by direct lines. Fig. 1 shows the district served by the West Flanders Ry., which had a total length of 113 English miles. It will be noticed that the main line afforded a direct route from Lille to the watering places of Ostend, Blankenberghe and Heyst, and it was this fact that caused the Belgian Government to cast covetous eyes at this prosperous independent undertaking, as they wanted to attract French traffic *via* Lille by doubling the line (the West Flanders was all single track) and providing a first class through service to the coast. Already through carriages were attached to the West Flanders trains at Bruges, and some of that Company's engines worked through to Blankenberghe and Heyst, but this did not satisfy the ambitious aims of the

State. It is satisfactory to know, under the circumstances, that no niggardly course has been followed and that the British shareholders have good reason to be satisfied with the terms they have secured. A single line over a flat country, the West Flanders has not afforded scope for the display of showy engineering, but what does render the line noteworthy is its ownership of old and historically interesting locomotives.

On October 5th, 1846, the first completed section—Bruges to Roulers—was opened with great ceremony, with four of Stephenson's long-boiler engines, built at Newcastle. The original drawings, which are represented in Figs. 3 and 4 by the courteous permission of M. de Lannoy, general manager, and M. Albert Fraeijs, chief engineer of the company, are still in the office at Bruges. It will be noticed (Fig. 4) that they are initialled by Robert Stephenson, and dated November 5th, 1845, in his own handwriting. The engines therefore probably represent his earliest design for this form of long-boiler engine.

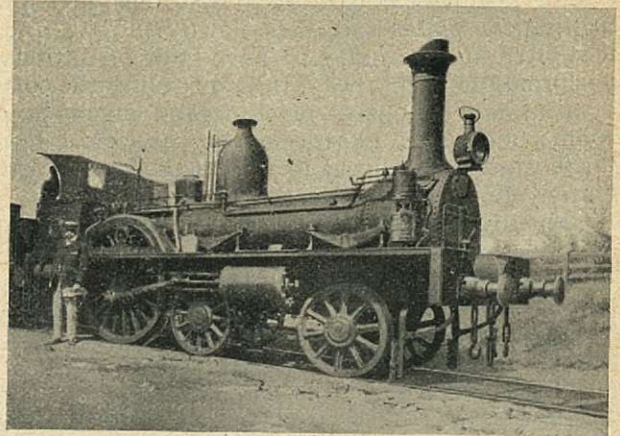


FIG. 2.

Four similar engines were supplied the following year by the Société St. Leonard, Liege, and these eight engines worked the line until 1853. As built, all eight had haycock fireboxes, but these,

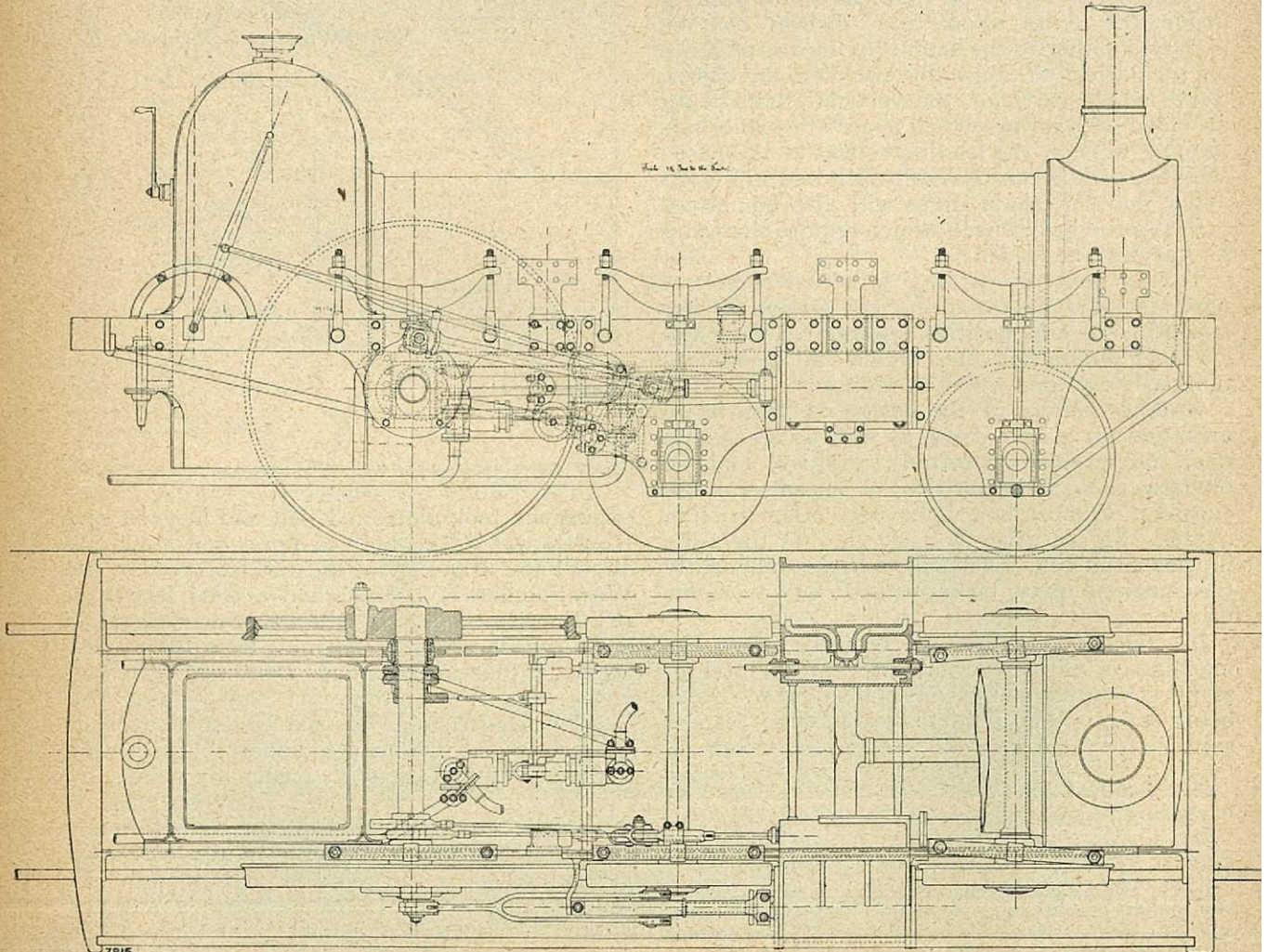


FIG. 3.

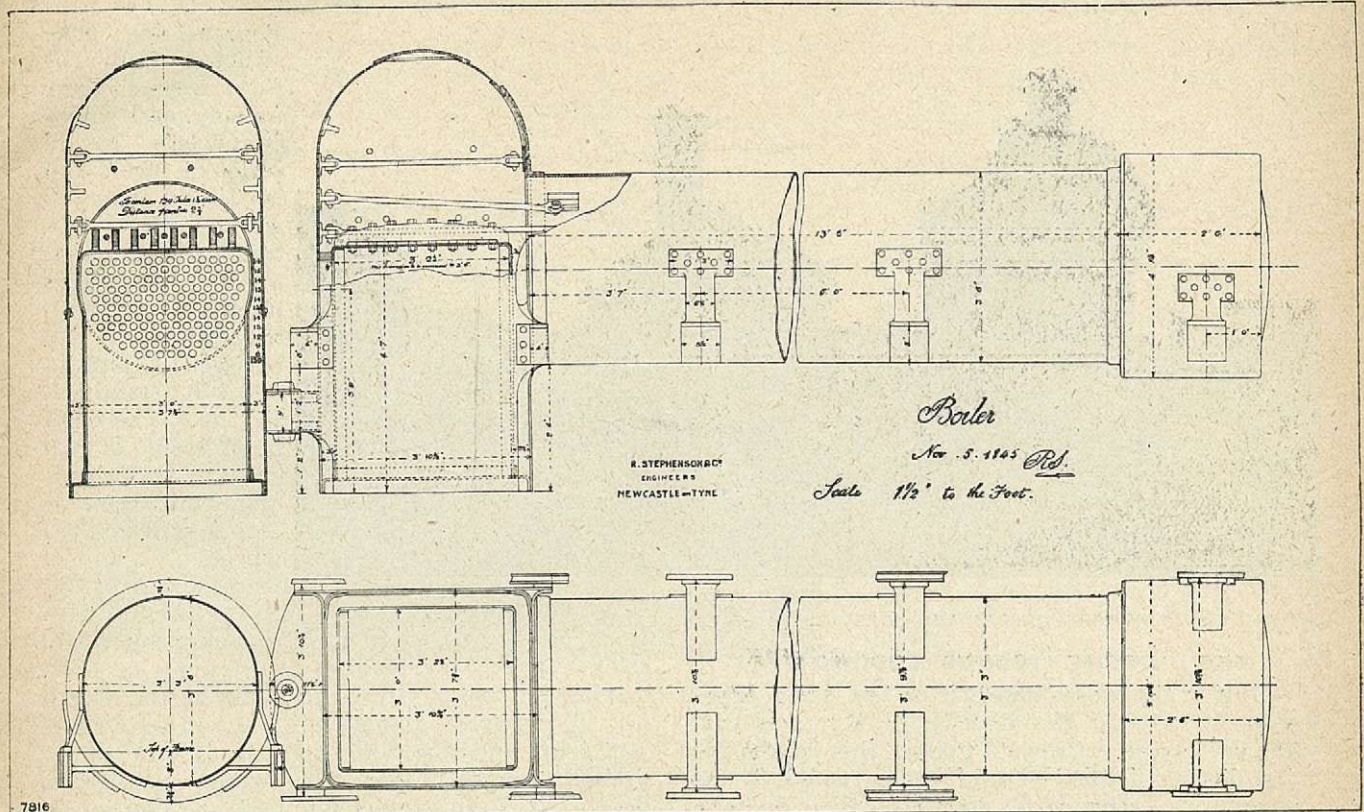


FIG. 4.

about 1863, were altered to the Belpaire form, which was better adapted for the Belgian slack coal employed. No. 1 has been scrapped, but the remaining seven were still running at the transfer, and employed in working the passenger

represents No. 7 of the second lot, photographed in motion at Ingelmunster. She began to work in 1847, and was then known as "La Belle Flamande." The dimensions of the eight are as follows: cylinders 15-in. by 24-in.; driving wheels

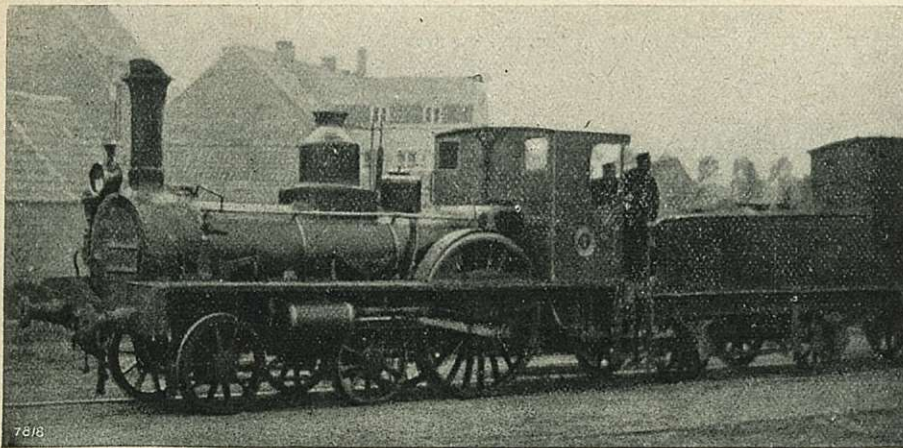


FIG. 5.

trains between Courtray, Ingelmunster and Thielt, and between Roulers and Ypres. No. 2, which was put on the line in October, 1846, is shown in Fig 2, as photographed in steam by the writer at Roulers in August, 1906. Fig. 5

6-ft. 6-in. diameter; heating surface: firebox 11.47 sq. ft., tubes (139) 850.93 sq. ft., total 862.4 sq. ft.; length between tube plates 14-ft. 2 $\frac{3}{4}$ -in.; thickness of boiler shell $\frac{1}{2}$ -in., working pressure 120 lb., the boiler being proved up to 180 lb. with cold water; weight empty 16 tons 1 $\frac{1}{2}$ cwt.

(To be continued.)

THE ATLAS METAL AND ALLOYS CO., LTD., 52, Queen Victoria Street, E.C., have an interesting display at the Mining Exhibition, Olympia, including a series of specimens of ores, drosses and furnace products

for resmelting and refining, showing intermediate stages leading up to the finished pure alloys, of which this firm makes a speciality. Specimen bearings taken from actual work are also shown, and we noticed a Tramcar Armature Bearing which had done the very respectable mileage of 84,000, and still remained in good condition.