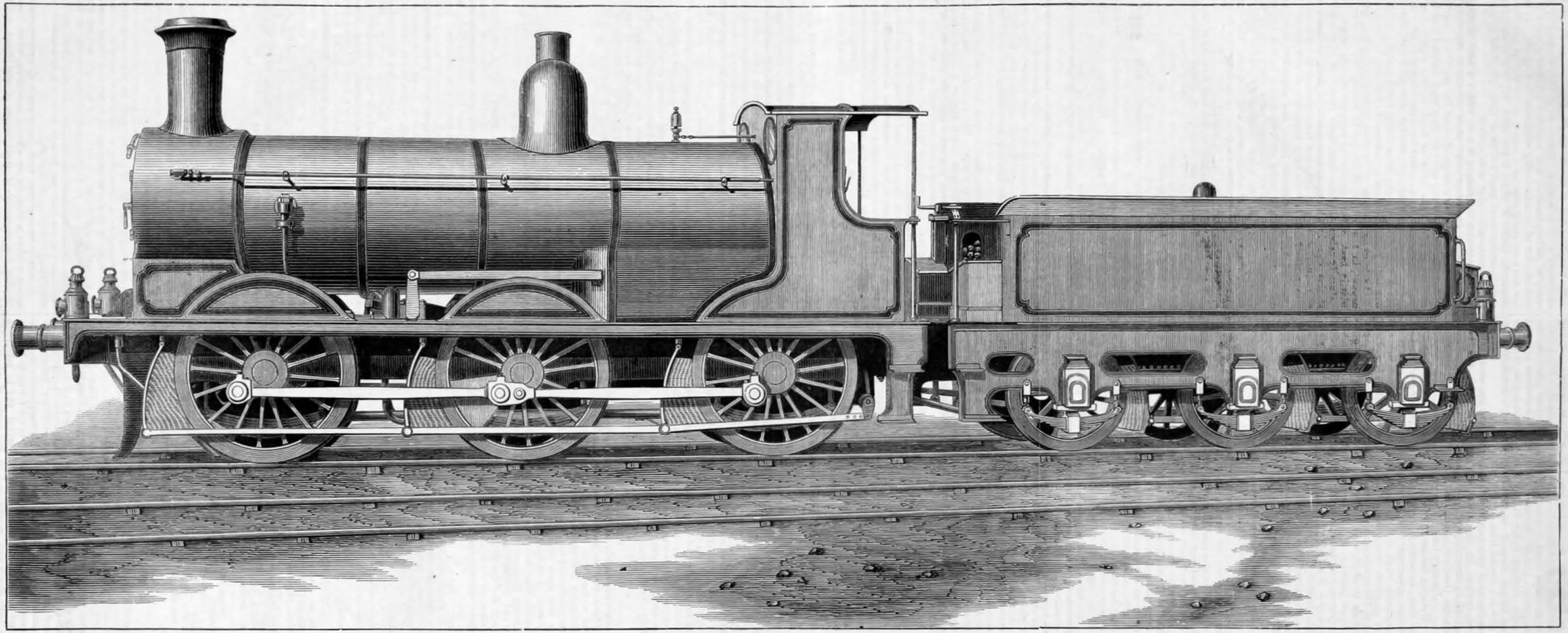
GOODS ENGINE, NORTH BRITISH RAILWAY.

MR. DRUMMOND, LOCOMOTIVE SUPERINTENDENT, ENGINEER.



We illustrate above a very fine type of goods engine, designed by Mr. Drummond, locomotive superintendent of the North British Railway, and constructed at the company's works at Cowlairs, near Glasgow. The engines are similar in external appearance to the new goods engines designed by Mr. Stroudley for the London and Brighton Railway, but are more powerful machines and considerably heavier. The work to be performed by these engines is very severe, as the grades are steep and very long, and the work has to be done in winter under very trying conditions of weather. The external characteristics of Mr. Drummond's new engines are very clearly shown in our engraving, and at some future time we hope to give some statistical information as to their performance.

The engine has the large number of 224 tubes, 1¾in. diameter. The cylinders are 18in. diameter and 26in. stroke. The six coupled wheels are 5ft. in diameter. The total weight of the engine under steam is 39 tons 15 cwt., while the tender, with 5 tons of coal and 2500 gallons of water, weighs 32 tons. The total weight is, therefore, 71 tons 15 cwt., or a little more than the weight of Mr. Johnson's new Midland passenger engines and tenders, which carry together 70 tons loaded, of which the tender represents 32 tons. The working pressure in Mr. Drummond's engines is 150 lb. They are, we believe, the most powerful goods engines at work in this country, and are giving the most complete satisfaction.

A Steel Rink.—In New Orleans a steel skating rink is in daily use. The plates are about $\frac{1}{16}$in. thick, and highly polished. They are bedded in oak planks which rest on india-rubber. The elasticity of the rink is perfect.

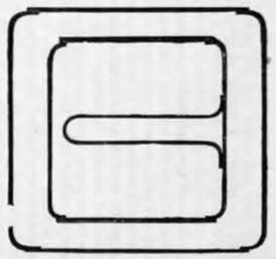
LETTERS TO THE EDITOR.

(We do not hold ourselves responsible for the opinions of our correspondents.)

LOCOMOTIVE FIRE BOXES.

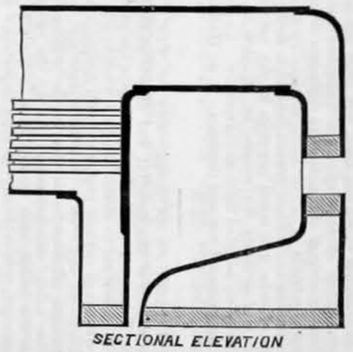
Sir,—I notice in your last week's impression several suggestions for improved locomotive and other fire-boxes, designed by Mr. Kaselowsky. I scarcely think he has got the right fire-box yet, although the principle of having the inner fire-box separate from the outer, except at the ring, is no doubt good as a preventive to straining the box by expansion. The objections I have to the box are:—(1) The corrugated plate—this I may here state is a very old idea, and one which has often suggested itself to my mind on account of its shape, giving to the expansion by heat, and without question it is stronger than a flat plate; but to do away with the stays it would have to be at least $\frac{3}{8}$in. or $\frac{1}{2}$in. thick, which for several reasons is very objectionable, and even then one would have a certain amount of uneasiness in riding on a locomotive furnished with a box of this kind; the idea that additional heating surface is gained is, I believe, a fallacy, which any one can reason out for themselves. (2) The curve of the inner box takes out so many of the tubes, and thus lessens the heating surface. (3) It seems impracticable to carry out for locomotive boxes, owing to the greatly diminished depth of the box, and of course diminished heating surface. The cast iron end is, I believe, good, and was suggested by myself to the late Wm. Bouch, locomotive superintendent on the L. and B. Railway, and had I not left him at that time for another appointment, would in all probability have been carried out, not in connection with the flat-topped fire-boxes, which was also a suggestion of my own.

About thirteen or fourteen years ago we built twelve engines with boxes of this kind, and they are good yet; the system has been altered by others, seemingly regardless of the principles involved, and as might have been expected, they have not given such satisfaction as we have found them to do. Many years ago, when going through my apprenticeship at Shildon, whenever a locomotive came in with a cracked tube plate, I made a point to examine it personally, and found that as a rule those failed most which had hanging stays attached not far from the tube plate, while the percentage was much less for those that had no slinging stays, or had them attached much nearer the centre of the roof. I made a calculation at that time, the result of which was that the inner box expands nearly $\frac{1}{8}$in. more than the outer in the same depth; the effect of this will be very evident every time the box cools, and to my mind sufficiently accounted for the number of cracked tube plates. The system was altered and we had not so much difficulty on that score afterwards.



SECTIONAL PLAN

In carrying out the cast iron end, the advantages we looked to were diminished cost, because the back plate is really of little use as heating surface; a fire door full width of the box could be used of course only, or better with the flat-topped inner box, thus adding to the facility for even firing as well as a perfect distribution of air over the entire surface of the rising gases. This could also have been aided by perforated bricks carried on the cast iron plate. Possibly Mr. Kaselowsky may be able to inform us if any boxes have been made in this way; it is self-evident to any engineer that the repairs will be much less, and the chance of rupture diminished, as well as other advantages. Another part of the locomotive fire-boxes which is, I think, somewhat neglected, viz, the partition



SECTIONAL ELEVATION

or midfeather, which was much in vogue at one time, but seems to have got into disfavour. There is no doubt they take a great deal of keeping up, and why?—because they are so much exposed to the expansion and contraction that they almost invariably go at the junction to the fire