

much desired knowledge. Now the School of Mines at Kingston has placed this within his reach, and it should prove an inestimable boon to the community.

The educationists interested, and the people of Kingston especially, are doing their best to build up an institution which will have an incalculable influence on the industrial future of this country; and as far as Ontario is concerned, Kingston is probably on the whole the most suitable of all places that could be selected for the purpose. A Kingston gentleman writing on the subject of the school to *THE CANADIAN ENGINEER*, says: "We should have had a mining school a quarter of a century ago. The governors of the school have raised \$35,000, which they hope to increase soon to \$50,000, while as yet no other place has done anything." While it is to the lasting credit of those Kingston gentlemen who have proven themselves so public spirited, it is to be hoped that manufacturers and men interested in our mining development in other parts of the country will not allow the burden to fall entirely on the shoulders of local men. This is an institution that may benefit thousands in the remotest parts of the province, and there is no channel of philanthropy so likely to bring back a stream of personal benefit to the man of bounty as this.

#### THE "LUCANIA'S" ENGINES.

In view of the startling "records" made recently by the "Lucania," the sister-boat to the renowned Cunarder "Campania," the following detailed account of her machinery from an English exchange will probably prove of interest:—

"Each set of engines has five cylinders—two high-pressure, one intermediate, and two low-pressure. The high-pressure cylinders are placed one at each end, above the low-pressure cylinders; while the intermediate is in the middle. In this way the great advantage pertaining to the balance of parts and of motion due to the three-crank engine is secured, while the adoption of five cylinders also enables the diameter of the low-pressure cylinders, and the pistons belonging to them, to be reduced to a size giving more satisfaction in working and upkeep. The diameters of the cylinders are:—High-pressure, each 37 in.; intermediate 79 in.; and low-pressure, each 98 in. The stroke of piston in each case is 69 in. Each pair of low-pressure and high-pressure cylinders, in tandem position, is connected with the ordinary sleeve stuffing box, having metallic packing. All the cylinders are steam-jacketed, and have automatic steam traps for the return of water to the hot well. The high-pressure piston-rods are not fitted with metallic packing in the ordinary sense, but with long brass sleeves. The cylinders and casings are borne by cast-iron frames, supported on a cast-iron bed-plate of the type which has already proved satisfactory in so many of the splendid vessels produced at Fairfield. The bed-plate, which is 5 ft. 6 in. deep, made up of box type castings, is bolted down to an exceedingly strong seating. The bolting of the engines to the seating had extra special attention, while the staying of the top weight of cylinders has been carefully looked to as regards bracing the several cylinders together fore and aft. From the base of the engines to the top of the cylinders the height is 47 ft. The valve attached to each of the high-pressure cylinders is of the piston type, having Buckley's packing. A slide valve is fitted to each of the low-pressure cylinders and to the intermediate one, the valve gear

being of the usual double eccentric and link-motion type. The pistons of the high-pressure cylinders are fitted with Ramsbottom rings, while the intermediate and low-pressure pistons have each one ring fitted with Downie's packing. The piston-rods and connecting-rods were forged from steel ingots, each connecting-rod in itself weighing about 10 tons. As evidencing the precautionary care taken to secure homogeneity and continuity in the metal of which these important items are made, it may be stated that, in the rough, each connecting-rod forging weighed in itself 25 tons. The condenser, which is rectangular in section, and of cast iron, is built up in three parts, and divided into two main sections in such a way as to enable each low-pressure cylinder to have its own condenser. The condenser is fitted with brass tubes  $\frac{3}{4}$  in. bore. Two air and two circulating pumps, each driven by a lever from each crosshead of the fore and of the after cylinders, are situated at the back of the condenser. From these crossheads pumps are also worked which lift water from the condenser to the feed-heater, which, with other of the accessories more properly connected with the boilers, will be described further on. An auxiliary condenser is provided in each engine-room for the needs of the air and circulating pumps, and for use when the vessel is in port and the main engine standing idle.

"There are two sets of circulating pumps and engines, each set comprising two centrifugal pumps in the middle, with one engine on each side. These have suction and discharge branches 20 in. internal diameter, and impellers 51 in. diameter, and engines of the tandem compound type. The collective quantity of water delivered by each set is about 16,000 gallons per minute, the speed when circulating being 100 revolutions per minute, and when pumping from the bilge 250 revolutions."

BEGINNING with our January number we propose to devote a page of space to a classified list of advertisers, giving each advertiser a line under one or more headings, and making a classification of subjects for the convenience of the reader. Our advertisers will oblige us and benefit themselves by sending us at once a memo of the different headings or subjects under which they wish their names to appear.

At the recent street railway convention held in Milwaukee the Canadian delegates extended an invitation to the convention to hold its meeting for 1895 in Montreal. This invitation will probably be accepted. If the convention were held here now we hardly know how we could hide the Montreal street railway; but 1895 is still some distance off, and by that time no doubt the Montreal company will have something good to show. At all events American railway men will find in Montreal an interesting city and may make sure of not going away disappointed.

THE frequent enquiries we have for back numbers of *THE CANADIAN ENGINEER* from the beginners show that the journal is appreciated and valued. Two or three months ago we asked subscribers to send us any copies of the May number which they did not need, as the May issue was entirely exhausted. We are still having calls for back numbers and shall be glad to pay the full price for any copies of the May number sent to us. Subscribers who are not binding the paper and who can spare this number, will oblige us by sending us their copies.