56,000 sec.-ft. can be utilized by the company under its agreement with the government, 24,000 sec.-ft. must be diverted into the main channel, and as this would improve the minimum flow through the main channel to 126,000 sec.-ft., it will make navigation better than it was before the work began. The total power available (56,000 sec.-ft. with 132 ft. head) is 150,000 h.p. at the outgoing terminals of the power house.

The conditions attending the construction of this plant were so favorable that they are unique in hydro-electric development: Good railways, good highways and excellent transportation by water were available; there was access to Montreal by two canals; the variation in head is very slight, the greatest variation any season being 4 ft., and the usual variation 2 ft.; the greatest variation on record amounted to 7 ft., and not in any one season; ice blockades do not occur below the power house, as the rapids break up the ice so that the head is practically always constant; when a channel was excavated through Cedars Point, the material encountered was very favorable; the usual flow of the river is 260,000 sec.-ft., of which 80,000 sec.-ft. flow into the Cedars channel, of which only 56,000 sec.-ft. are needed. Mr. Holgate said that such favorable conditions as these would make very envious many engineers who had to design and construct developments in inaccessible places, and where storage work was expensive and difficult.

To obviate frazil, the company built a 1,000-ft. dyke, creating a large pond or reservoir. This is ice-covered in winter and prevents the formation of anchor ice or frazil, which does not enter the pond, the velocity of the river being sufficient to carry the frazil along into the main channel in the upper four or five feet of the stream.

In December, 1914, the plant was put into operation. The turbines are single-runner machines and are the largest of their kind yet made. They will be described in more detail in Messrs. Smith and Wilson's paper, as will also the foundations and unwatering of the site, the methods adopted being new in hydro-electric development, said Mr. Holgate.

The work was completed ahead of time and the estimated costs were not exceeded. The design of the plant and the execution of the work were under Mr. R. M. Wilson and Mr. Julian C. Smith. Fraser & Brace were the contractors.

In the discussion that followed the reading of Mr. Holgate's paper, Mr. Walter J. Francis and other engineers took exception to Mr. Holgate's remarks regarding the arbitration proceedings for the islands, and stated that the decision of the Privy Council was by no means entirely clear, although that was the impression that Mr. Holgate gave, they claimed. Mr. Francis and several other prominent engineers had given evidence differing with the valuation placed on the properties by Mr. Holgate on behalf of the company, and Mr. Francis stated that the matter was not yet by any means entirely clear and settled.

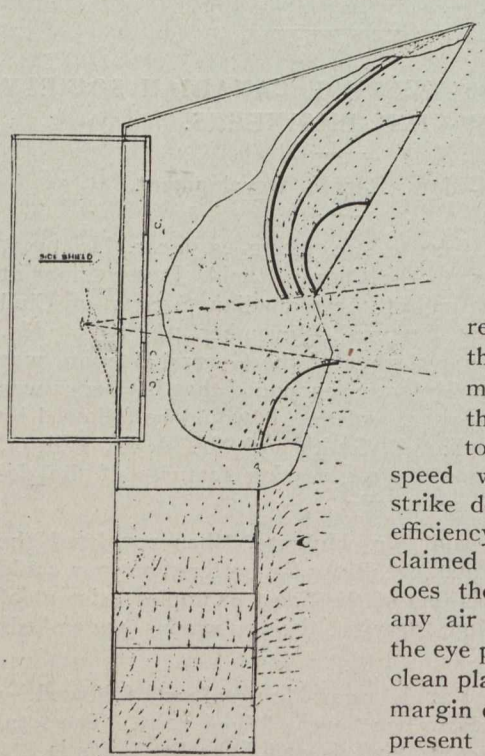
Mr. Julian C. Smith pointed out that conservation is best served by the construction of water power plants. He said that one of the truest forms of conservation is the development of the country's water powers under proper control. Coal is saved, and power which would otherwise be wasted, is obtained for useful purposes. Employment is given, and comfort and luxury are secured which could not be had without these developments. Civilization is advanced. Mr. Smith said that the Society should foster the idea that it is in the public interest that these water powers be developed.

A USEFUL RAILROAD DEVICE.

The accompanying photograph and diagram are descriptive of a lookout mask recently invented by Mr. E. J. McMillan, a resident of Moose Jaw, Sask., which involves a system of double deflection that should meet with

Device as Installed on a Locomotive in Service.

the consideration of railway officials. As the diagram illustrates, the double deflector shield for use on locomotives produces a pressure at one and a suction at the other side of the necessary line of vision, using these forces of the air currents themselves generated by the motion of fast-moving locomotives to gap across sufficient space through which the driver may receive full protection to his eyes without the intervention of glass which gives such unreliable service in sleet, snow or rain.



Double Deflector Shield for Locomotives.

As the air currents presented to the front of the mask always bear the same relation to each other, the speed with which they strike does not alter the efficiency of it. It is claimed that not only does the device prevent any air coming through the eye port but that with clean planes it has such a margin of efficiency as at present constructed that while going the full speed of a train if a match be lit within the eye port the flame will be drawn forward through the port and toward the downward rushing air near the front of the shield. The excess margin of safety is allowed for so that the protection will be full even in the case of a soft snow fall, which is the most severe test to which a device of this kind may be subjected.