

3,853 arc lights and 409,503 incandescents. It is, therefore, behind Ontario by 4,571 arcs and 158,990 incandescents. It has made, however, greater proportionate gain since 1898 than Ontario, the gain in arcs being: Ontario, 36.2 per cent.; Quebec, 47.6 per cent.; and in incandescents: Ontario, 138.6 per cent., and Quebec, 212.3 per cent. During the period 1898-1903 the number of plants in Quebec increased by 13.

The largest single plant in the Dominion is that of Toronto, with its 170,000 lamps, arcs being taken as each equal to 10 incandescents. The next largest is that of the Lachine Rapids Hydraulic & Land Co., Montreal, 158,503. The third in size is the Ottawa Electric Co. with 111,927 lights.

The other provinces have made considerable progress. To the west, Manitoba has increased in 1898-1903 its arc lights from 162 to 375, and its incandescents from 13,800 to 31,905.

The North-West Territories have not increased as rapidly as the other parts of the Dominion, their arcs numbering 29, an increase of 4 in the period named, and their incandescents numbering 6,677, an increase of 1,997.

British Columbia shows the largest proportionate increase of any of the divisions of Canada, its increase of arcs being 377, or 82 per cent., and of incandescents, 74,297, or 257 per cent. In 1898 British Columbia and Nova Scotia had almost the same number, British Columbia having 7 more arcs and 169 more incandescents; yet Nova Scotia has

increased the number of its incandescents by 32,140, or 11.16 per cent. The three Maritime Provinces had in 1898, 951 arc lights and 46,977 incandescents, and in 1903 they had 1,267 arcs and 93,120 incandescents, an increase of 33½ per cent. for arcs, and of over 98 per cent. for incandescents.

The imports of the country as well as the increased manufactured output of our own establishments attest the vigorous development of electricity as the harnessed servant of humanity. Of electric arc lights and carbon and carbon points we imported during the past fourteen years an average of \$35,000 worth a year, and the last two years' average was \$76,200. Of electric light apparatus and batteries we imported in fourteen years an annual average of \$407,000, and the last two years the average was \$1,090,050. Of electric motors and meters in fourteen years we imported \$151,700 a year. The average of the last two years is \$378,300.

It appears to me that the outlook for Canada is one that shows the country going forward by leaps and bounds in its application of electricity. Electricity will drive the carriages on the king's highway as well as those on the iron way. It will do our ploughing, our sowing and our reaping. It will make trolley parks an important part of the national equipment for recreation. If it does not help us into this life, it will help some (no one of this association of course) out of it—by order of justice. It will do the nation's smelting and welding. It will supply from peat bogs fuel for Ontario and Quebec.

In the form of the "wireless" it will make travel by sea along our coasts and estuaries as safe as travel about the streets of our towns. It will make our hats, cook our dinners and warm our toes. It will become so tame to our service that it will with the message present a photo of the speaker, and cut out in one town a cheque on a bank written hundreds of miles away, and do it so well that the original will be destroyed and the transmitted cheque remain the only existing original. We already have twelve messages over the one wire. How many more who can say? We have in use a telegraph-telephone system by which our railways can employ the same wire for both simultaneously. Our surgeons use it to minister to mind and body diseased. Our warriors use it in the form of the wireless to transmit orders from the right to the left of an army in extended order and thus are able to set thousands moving as one at the same instant over miles of distance.

In fact the electrical engineer is dealing with a force whose uses have become, and promise to become even more in the future than in the past, so varied that more than any profession a man has to be a hustler all the time or he will become a way-back even while he is positive he is well to the front. The up-to-date man of to-day is rear-guard to-morrow if he is not always on the alert, so rapid are the movements, so numerous the applications of the electrical forces.

DEPARTMENT AGRICULTURE, OTTAWA,  
May 16, 1904.

### SCIENTIFIC GLUE HEATING EQUIPMENT.

The accompanying illustration is of the Wetmore Glue Heater, manufactured by the Advance Machinery Co., Toledo, Ohio.

This appliance is built in six different designs in all sizes, from 2 to 150 gallons capacity. About two years ago the company started this business by placing on the market a cooker or tank of 10 gallons capacity for dissolving glue. The tank, while at the time very crude, was a wonderful improvement over methods at that time in vogue. Improvements and additions have been made from time to time, until to-day the company is in position to offer its heater and other copper appliances for the glue room under an absolute guarantee that the purchaser will realize sufficient savings by its use over old methods to return its cost in a year. They are sent out for thirty days trial under this guarantee. These appliances are now made for use in connection with gas, steam and electricity. For steam there is a patent siphon for introducing it into cold water. For electricity electric coils and all attachments are furnished, together with a switch which enables the user to bring glue to 150° in a very short time, and thereafter reduces the current to a point where glue will retain the proper heat throughout the day. Pot heaters are also made to be arranged at the workman's bench. These are arranged for heating by steam, gas or electricity. They save a wonderful

amount of time by permitting the workman to have a pot of hot glue at his bench at all times.

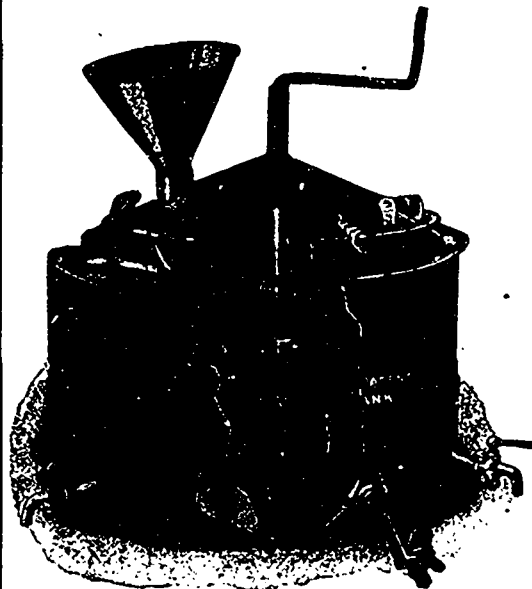
For steam it is necessary to pipe it from the boiler. For gas a tube or pipe is run from the individual pot heater to the gas supply. For electricity a cord is run from the heater to an electric wire and is controlled by a switch, as in the case of the large heaters.

Glue should be placed to soak in cold

water in a separate vessel. Every glue manufacturer recommends this, for the reason that in order to absorb the requisite amount of water glue should be kept cool. As soon as it is heated it swells, which closes the pores and prevents absorption. If flake glue is placed to soak in cold water at night it can be prepared ready for use in one-fourth the time that is necessary where the users place it to soak in the cooker. While almost any bucket will do for this purpose, a very handy one, one especially designed for this purpose, is described on page 28 of their catalogue.

Whereas the glue room in the ordinary factory has in the past been a very dirty affair, a number of institutions have installed these individual pot heaters for the bench, and a Wetmore Heater as a central source of supply, and these glue rooms are as neat as any part of the factory. Page 8 of the catalogue refers to this matter.

This economic appliance, which is now in wide use by woodworkers and others, is manufactured for the Canadian trade at Windsor, Ont., and thus supplied free of duty and at the lowest possible cost. All correspondence should be addressed to the head offices of the company at Toledo, Ohio.



Wetmore Glue Heater.

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER.