

structure of pressed brick. In the boiler-room, separated by a brick fire wall from the rest of the building, are three Goldie & McCulloch boilers 66 inches by 14 feet, of their standard horizontal type, space being provided for additions to be made as required. The engines at present installed consist of two Wheelock tandem compound, 15 x 26 x 34, each capable of working condensing up to 300 h.p. The generators, one of which is belted direct to the fly-wheel of each engine, are of the Canadian General Electric Company's multipolar type, having a capacity of 200 kilowatts each. The switchboard, built up of white marble panels, contains the standard equipment of station apparatus, the ammeters and voltmeter being of the Weston round pattern.

Altogether the Hamilton Radial Electric Railway, as embodying the most recent features which bear the stamp of approved practice in work of this class, is well worthy of a visit of inspection by those interested in electric railway development.

#### THE CLOSE CORPORATION QUESTION.

If the Canadian Society of Civil Engineers takes the advice of the New York *Engineering Magazine*, regarding the plan of "close corporation" initiated in Manitoba, they will "pause and take a big think," to use the words of the American humorist. One can understand, of course, why American engineers would not look with favor on an Act, the rigid application of which would restrict their practice in Canada; but without reference to the effect of such an Act on the American profession, it is a question in which the Canadian Society of Civil Engineers can well afford to tread slowly. It is true that the Ontario Association of Land Surveyors have been successful as a close corporation, but the relations of the civil engineers to the public are not on the same lines. Indeed, the general question as to whether the C. S. of C. E. should be converted into a close corporation at all is one on which we find a great diversity of opinion in the society itself, and a more thorough enquiry into all its bearings would be advisable.

The following are the observations of the *Engineering Magazine* :—

"Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Manitoba," has enacted a bill "which may be cited as the Manitoba Civil Engineers' Act," by which the profession is closed in the Province of Manitoba.

This is in line with the tendencies which have recently been so strongly marked, both in public and private expression, throughout the Dominion, and the passage of the Act seems to have been directly secured by the influence of the Canadian Society of Civil Engineers, working through their committee. It will be generally regarded in the country as a step backward; but an examination of the text of the bill shows the step to be almost amazingly short and hesitating. Sixteen of the eighteen sections are devoted entirely to the organization, constitution, and administration of the Canadian Society of Civil Engineers, the remaining two sections are as follows :—

17. On and after the 1st day of July, 1896, no person shall be entitled within this Province to take or use the name and title of "civil engineer" or any abbreviation thereof, either alone or in combination with any other word or words, or any name, title, or description implying that he is a member of the said Society of Civil

Engineers, or act as engineer in laying out, advising on, constructing, or superintending the construction of any railway or public work, or any work upon which public money is expended, the cost of which shall exceed \$500, unless such person is a member of the Society hereby incorporated and registered as such, under the provisions of the Act, or unless he is a duly qualified engineer, and entitled to use the title of civil engineer by virtue of some statute in force in this province, or by the authority of some institution of learning in this province, having authority to confer degrees in civil engineering, or unless he has been practising as a civil engineer in this province at the time of the passing of this Act, or unless he is a member in good standing of some institution of civil engineers in Great Britain and Ireland, or of some national society of civil engineers of good standing in any foreign country.

18. This Act shall be deemed a public Act.

As remarked by the *Engineering News*, "the breadth of the exceptions is praiseworthy, but it is also to be noted that the law provides no pains or penalties for those who disregard its provisions." It is rather severe on the registrar of the society, who shall "make, or cause to be made, any falsification in the matter relating to the register," but a violation of the Act itself is not even declared to be a misdemeanor. To commend an Act for its omissions and exceptions is decidedly to damn it with faint praise, but it is the only ground on which the condemnation could be extended to a measure which, in principle, has no justification in public policy, and can scarcely fail to result in formalism and stagnation within the profession.

For THE CANADIAN ENGINEER.

#### THE KIND AND CHAUDRON PROCESS OF SINKING AND TUBING THROUGH WATERY STRATA.

BY E. ANDREWES.

Over a considerable area in France and Germany a loose stratum, consisting of watery marls, is encountered at a moderate depth. The attempts of engineers to sink shafts through this by ordinary methods for some time proved failures. Pebbles and fine rock interfered with operations, and the water completely drowned out the shafts.

To overcome these difficulties Herr Kind, in 1850, originated a scheme for mechanically sinking shafts. His machine was practically a percussion drill or borer on a large scale. He also introduced a variation in the mode of lowering the tubing and a device for regulating the influx of water. To this M. Chaudron added the sliding bottom piece, to form a perfectly water-tight joint at the bottom of the tubing.

A hole is first drilled about 4.5 feet wide, in which the debris may accumulate. A larger tool, working 50 feet behind, widens the shaft to the required diameter. The drill tool is called a trepan, and is suspended by rods from the walking beam of an engine.

The smaller trepan (Fig. 1) is a blade of forged iron, on which are keyed a number of steel teeth. A stem connects the blade to the suspension rods by means of a sliding box, which prevents the jar from being communicated to the rods. The trepans are raised six inches or so, turned slightly and dropped. They are of massive construction, weighing from 8 tons up, for hard rock. Their concussion disintegrates the rock along a diameter of the circle. A progress is made of from 3 inches in flint per day to 3 feet in chalk, 1 foot in sandstone, 16 inches in coal