and as the water is thus forced through at a very high pressure, the water escaping through the bottom end of the shaft, A, acts upon and excavates the soil into which the said shaft penetrates. The water which does not pass through the shaft, A, is forced through the turbine. B, thus causing the said turbine to revolve, and as the turbine is fixed to the shaft, A, the shaft also revolves and carries with it the cutters, I, which quickly cut and excavate the soil into which the machine penetrates. After the water has passed through the turbine, B, it immediately comes in contact with and is acted upon by the propeller or archimedian screw, C, so as to increase the pressure against the water and force it through the opening, d, formed around the casing, D, as shown. The water thus forced through the opening, d, acts against and forces upwardly the soil loosened by the cutters, I, and by the water forced through the end of the revolving shaft, A. In this way my boring machine quickly penetrates the soil under water, and makes a perfect hole to receive the pile it is intended for.

I may mention here that I prefer to make the hole slightly smaller than the pile it is made for, so that the said pile may be gently tapped into position, and be a good solid fit for the hole. Should the machine encounter rock, I provide a diamond drill which may be readily attached to the end of shaft, A. As I do not claim anything in the mechanism for raising and lowering my boring machine, it is not necessary to describe or show any mechanism in this specification. It will be sufficient to say that suitable mechanism must be provided by which my boring machine may be readily lowered to the bottom of the water and as easily withdrawn after it has performed its work. It is also necessary to provide simple mechanism by which the pile may be easily lowered and guided into the hole prepared by the said boring machine. Although I consider that a turbine wheel connected to the shaft, A, and operated by water, will be the best means for revolving the said shaft, it would of course be possible to drive it by means of steam or gearing, in which case the turbine would be dispensed with, and the other power substituted.

# CANADIAN ASSOCIATION OF STATIONARY ENGINEERS.

#### READABLE REPORT FROM BRO. EDKINS.

Editor CANADIAN ENGINEER :

DEAR SIR,-On Feb. 13th last I visited Brockville No. 15, C.A.S.E., and found that branch progressing very favorably under the direction of W. F. Chapman, their energetic president On the night in question it happened to be " Educational Night," and I had the pleasure of seeing several of the members do some good work on the blackboard, and also indulge in some hearty discussions. One thing struck me very forcibly as illustrating the educational benefits to be derived by engineers from membership in the C.A.S.E., viz., I saw several members figure out the heating surface of a given size of boiler, and the h.p. of an engine, who could not do simple multiplication when they joined the association. Brockville No. 15 have a hall to themselves, and have furnished it comfortably, and meet generally twice a week. Bro. Chapman, the president, is very popular with the members, and deservedly so, for he devotes a large portion of his time and energy to their interests.

I also visited Kingston on Feb 15th, and had a talk with the leading members This association now has a membership of over 40, and has held very instructive and interesting meetings during the winter.

Being in Guelph a few days ago. I called on Bro. C. J. Jorden, and was pleased to learn that No. 6 is beginning to show signs of increased activity again.

I would particularly ask the secretaries of associations in my

district to report their meetings and all matters of interest to engineers happening in their several localities to THE CANADIAN ENGINEER, and also to take the trouble to see that their associations are correctly reported in the directory, with the proper names of officers attached. A post card will put this matter right at any time.

If the engineers in any town where there is no association would like to organize, and will write me, I shall be glad to furnish all particulars.

	Yours very truly,
/	E. A. EDKINS,
	Prov. Deputy, Ontario
Toronto, March 25th.	• •

HOW HAMILTON HOLDS OUT. Editor Canadian Engineers:

At our last meetings considerable business of importance was transacted, and a good number of interesting discussions actively indulged in. Among the most important subjects was "The Requirements of an Engineer" at different plants, and what kind of a man is required as engineer. This discussion arose upon the appointment of the two representatives to wait upon Sir Oliver Mowat in connection with the bill asking the Government to grant an inspection and license law, and the members of this lodge were very much pleased with their report upon their return home. We intend holding our annual supper on Good Friday Eve, at the Commercial Hotel, same place as last year, and it is unnecessary for me to say that all attending will have a good time.

### WM. NORRIS. COL.-Sec.

#### Hamilton, March 21st, 1895.

## ODD ITEMS FROM OTTAWA.

Frank Merrill, of Ottawa, has passed the examinations of the Stationary Engineers' Association for a first-class certificate. Steven Martin, of Kars, has passed for a third-class certificate. Frank Robert, of the Ottawa branch of the association, conducted the examinations. The members of the association in Ottawa are still discussing the many advanced ideas on "heat," expressed by A. M. Wickens, chief engineer of the Government buildings at Toronto, in a recent address before the Ottawa branch of the Stationary Engineers' Association. Ottawa engineers are anxiously watching the bill now before the Ontario Legislature, making the examination of engineers compulsory.

## THE ALLARD PROCESS OF HARDENING COPPER AND ALUMINUM.

Correspondence of CANADIAN ENGINEER.

Answering to your request of the 6th inst., for information as to the Allard process of hardening, tempering copper, aluminum, and referring me to the Citadel, Quebec, for the result of a recent test of what I understand from the makers of the gun to have been of aluminum, but which the report—copy of which I append says to have been of copper—I beg to say that, desirable as it would be that the old secret of tempering these softer metals had been re-discovered, and by one of our own countrymen, I can find nothing tangible on the subject. I have written Allard himself, and Carrier, Laine & Co. Their silence portends "Nothing to say."

Now, as to the test of the gun, which as you will see by the report was only a twelve-inch one, with a  $\frac{1}{2}$  inch bore, and  $\frac{1}{2}$  inch thickness, or a little more, at the breech—the test merely consisted in two trials of the gun; the first with  $\frac{1}{2}$  oz, powder, the other with  $\frac{1}{2}$  oz, under these tests the gun neither gave way nor expanded its bore.

The fact is that, as Capt. Imlah admits, the test was absolutely valueless and proves nothing; and it is evident to me, as it must be to you, that the true test would have consisted in having two guns of equal size and of the same material, the one hardened or tempered, the other not so. Both guns should then have been trued with equal charges until the softer burst; the charge should then have been gradually increased in the tempered or harder piece and the experiment continued till that also burst, and then some idea could have been had of the relative resistances of the two metals as tempered and untempered. And if such charges of powder as required to rupture them could not be introduced, hydraulic power should have been resorted to.

In other respects, and though mechanical engineers are reticent of the truth for fear of injuring Allard, or of running the risk of saying what may not be borne out by further tests of the pretended discovery, I can find nothing to the point. One of our best machinists who was shown by Allard some bits of supposed-to-be tempered copper, says they did not stand the test he put them