

with ice and so materially reduce the quantity of water passing through them.

It may be said, "How is it that water power is furnished throughes flumes " or sluices from the Lachine Canal and other sources in winter?"

The reply is, that the Lachine Canal is a mill pond of quiet water, its ice is on the surface only, hence the sluice gates work with comparative ease.

The St. Lawrence River will not be a quiet pond, but on the contrary a rushing mass of water and *frasil* under its surface ice intermixed with innumerable blocks of moving ice large and small, ready to rush into the sluice way apertures, there to be mixed with *frasil* and cemented by anchor-ice into a compact mass that will hold down the sluice gates and fill the apertures, like molten lead run into a setting of iron with stone.

But few are aware of what is going on under the St. Lawrence surface-ice, or realise that every winter the *frasil* ice forms under the surface ice and clings to it, making a mass at some points extending to the very bottom of the river.

At the Victoria Bridge, in February of this year, I found the surface ice 3 feet thick, and in some places the *frasil* ice was nine feet thick below it. This was observed where the stream was rushing with a velocity equal to a torrent. The *frasil* ice holds its position, for it clings to the surface ice, the water in its rush becoming excellent material for making more anchor ice, because such ice only forms where water is agitated, not where it is in repose.

It is, therefore, no assumption, or an engineering theory that these sluice-ways would be blocked with *frasil*, but is a fact patent to every one conversant with our climate. Therefore we must now see where the winter and flood water of the St. Lawrence would go.