How to connect your power supply to your elements

In the early days of the studio glass movement we made all our connection boards with asbestos cement board, a semi-hard material that is now highly illegal. Marinite board from the 1960s and 70s also had a percent of asbestos, but not now. The marinite board sold by Joppa Glassworks is 100% asbestos free (it is made of calcium silicate), fairly rigid but soft enough so it can be drilled and carved with a knife. It can withstand 1800˚F. and as long as it is dry it is electrically inert. So it makes a good connection board material.

Before we begin, I know there are a lot of you who are wondering why go to all the trouble to make a firm connection board when you could just bend over the element leads on the outside of the kiln and attach the power with a split nut connector. Voila! the 25¢ solution. Great for you and for me. I cannot tell you how many people call me after just a few months and say their element burnt up. I say where? They say at the connection. Oh, too bad for you. Now that easy to install system is starting to cost something because the only thing you can do is replace the element. What happens in the split nut arrangement is pretty simple. Every time the element heats up the connection warms up too and it stretches a little (like microns). Nothing actually goes back to its original shape and over time this stretching results in an actual gap, like a loose connection which can produce a micro-spark. With the sparking comes a poorer connection yet, until one day it just arcs like in an arc welder and burns right through the lead. The power lead freed from support can then drop down and short off the shell of the kiln. That's a lot of fireworks for 25¢. The split nut connector is not a good solution.

If you build a connection board as shown in figure 28 and figure 29 the kind of problems encountered in the previous paragraph are eliminated. This system is designed to keep the connections cool in temperature and structurally sound and rigidly positioned. Begin by mounting the board on a pair of two inch deep sheet metal brackets so the board runs parallel to and vertically up the back of the kiln over the area where the element leads go through the kiln wall. For each element lead drill a hole in the marinite for the lead to come through. Next to this drill another hole in which you mount a bolt and nut. Tighten these bolts with washers and a lock washer so they are firmly affixed to the marinite board. Then attach the element lead to the bolt by wrapping the lead around the bolt once, clip off the remaining lead tail, and tighten another nut on top of the element lead. There should be room above this connection to attach the electrical power.

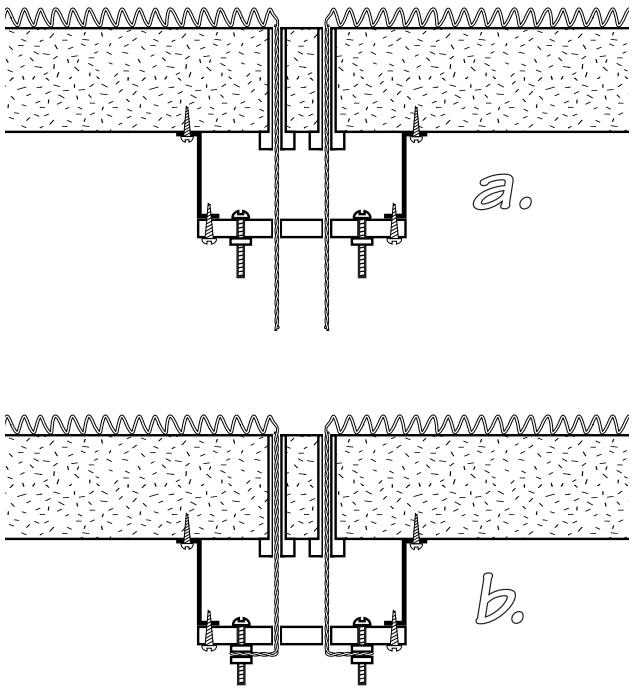

Fig. 28 a and b. In "a" we see the element leads pulled through the insulator tubes and through the marinite board. In "b" we see the leads bent and wrapped one turn about the bolt stacks and snugged down with a nut on top of the element leads. This connection board is now ready for the power to connect to these bolt stacks.

The marinite connection board built correctly will promote a natural draft up the back of the kiln. The space between the marinite board and the kiln wall should be about two inches deep. As the kiln warms this space will heat up the air which rises drawing in cool air in the bottom. This is a natural draft system which is made more effective with a cover which is screened on the top and bottom. You can see what a covered marinite board looks like in figure 26 in the small highlighted circle. This is a simple chimney effect and there will be a big temperature differential between the inner space near the