pump to achieve the maximum rate of pumping; too rapid flow will cause the diaphragm to buzz without accomplishing anything. The pump is sometimes temperamental about starting. Very often the trouble can be traced to faulty construction, but it is also true that valves and diaphragm improve after they have been in place for a time. Once started, the pump will run for weeks without attention. Sometimes the air is slowly absorbed from the air chamber and must be replaced. This can be done by blowing air through the intake. The pump will work in any position, but the air chamber must be more or less vertical with the stopper down.

High efficiency depends chiefly upon well-fitting valves and rapid inflow. As many as four parallel intake tubes have been put in with very satisfactory results. The writer has for the most part used the pump simply submerged in the barrel of sea water that was being circulated. The exhaust tube was, of course, extended to a point above the surface of the water.

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AN INEXPENSIVE WARM STAGE

A WARM stage is a very useful addition to the microscope, particularly for such investigations as the demonstration of motile amoebae in stools. Where only an occasional examination is made, the cost ($15 to $20) is likely to be prohibitive.

A very serviceable stage can be made at a trivial cost from an electric iron heating element. This comes copper clad and slotted as shown in the drawing. It draws 550 watts at 110 volts, becoming red hot. However, if it is connected to the secondary terminals of a

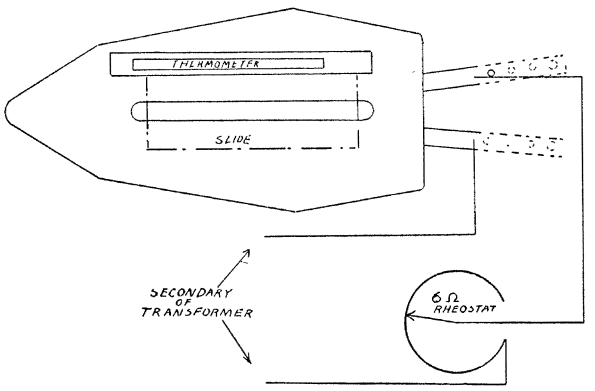

FIG. 1

bell-ringing transformer, it does not take much current and rises to a temperature of 40° C. or less. By connecting a 6-ohm radio rheostat in series, the current can be regulated so as to maintain a temperature of 37° C.

The construction is quite simple. With a hack-saw or grindstone, remove most of the side of a piece of ⅛″ pipe about 3½″ long, leaving both ends. This furnishes the thermometer carrier. The slot enables the operator to read the temperature. Lay the element on a piece of asbestos and connect the terminals to the 110-volt mains. The element becomes quite hot in a few seconds. Place a strip of solder about ½″ from the slot. Place the pipe on the molten solder and disconnect the electric current. When cool, the pipe will be firmly fastened to the element. Cut off the portion of the element terminals shown in dotted lines and solder wires to them. Connect these wires to the transformer through the rheostat.

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