in this instance the number of any one will represent the pressure at that point. The difference in pressure between any two points would be got by subtracting the smaller number from the larger. The essential feature of this arrangement is that the water must be allowed to flow freely from the distant end of the pipe; if it were stopped by a valve there would be a uniform pressure of 100 from end to end and our whole scheme upset. If the above arrangement is properly understood there will be no difficulty in following the application of the same principle to electricity.

Let us suppose that a current from the main is available at 100 volts, and that we want to get a lower voltage with a certainty that it will never rise above this. Wire of moderately high resisting metal is wound closely on to a cylinder of some non-conducting material, such as slate, in a single layer, but adjacent turns must not touch each other. Now let us suppose that when finished there are exactly 100 turns of this wire, and when we join its two ends to the 100 volt current the latter flows through. Exactly as in the water pipe we may consider the pressure at the positive end as 100, and 0 at the negative. Also there will be a constant fall of pressure from the positive end to the negative; the fall will be one volt for each turn of wire, and if the latter were numbered we could tap off any desired voltage. Here, again, it is essential that the current continue to flow from end to end and back to the main, and being joined in this way across the two main terminals independently is call a *shunt*, or parallel, connection; hence the name "shunt resistance." An ordinary electric lamp is connected to the main current in exactly the same way.

To use this device we connect one wire to one end of the resistance, and the other is usually connected to a metal slider that may be moved along from end to end, touching all the wires in turn. When it is at the same end as the wire already connected, the voltage between them is, of course, nil, but as we move the slider towards the other