962. **The electrodynamometer.**—The principle of the electrodynamometer is that of measuring the repulsion between parallel currents moving in opposite directions, one of them being fixed and the other movable. Fig. 902 represents the essential features of a form devised by Messrs. Siemens for measuring the strength of the powerful currents used in electric lighting: w is a coil of stout insulated copper wire, and w' a single wire; $n\,n$ are mercury cups, and $k\,k$ binding screw, by which connection is made with the main circuit L L.

The wire w' is surrounded by a stout spiral spring, which is connected at one end with this wire, and at the other with a screw, s; this is provided with an index, z, which moves over a graduated scale, S. An index, $z'z'$, is also fixed to the wire w'. At the outset both indexes point to zero; when the current passes it will be seen from the direction of the arrows that it traverses the fixed and movable coils in opposite directions, and the point z' is displaced along the scale. By turning the screw s it is brought back to zero, in doing which the index z is moved through an angle which is a measure of the torsion of the spiral spring f, and this angle is proportional to the square of the strength of the current by which the movable coil is deflected.

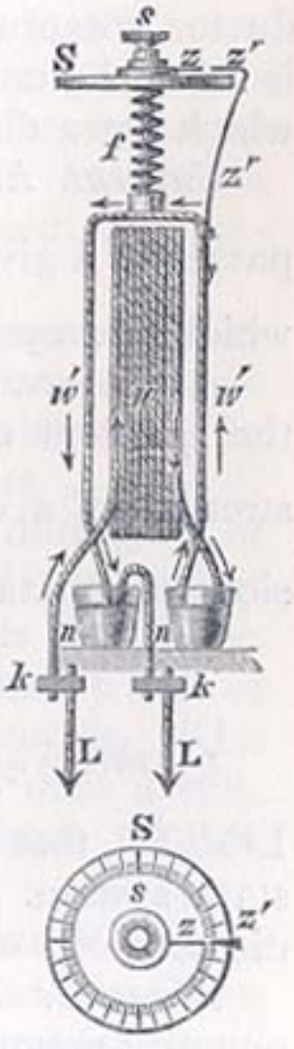

Fig. 902.

963. **Absolute electrical units.**—The great importance of having a uniform system of measurements of physical magnitudes which should be universally adopted is at once obvious, and this has been more especially felt in the applications of electricity. The first step in this direction was taken by the British Association, which adopted the system of absolute units known as the C.G.S. system, of which mention has already been made (61*a*, 709), and which this account is intended to supplement.

The essence of an absolute system of physical measurements is that the various units may be directly expressed in mechanical units (61*a*). A system