condenser, and is called such because a given electromotive force can charge one surface—the other being connected to earth—with a larger quantity of electricity than if it stood alone. From what has been stated already it will be evident that a condenser consists essentially of two conducting surfaces separated by a non-conductor or insulator, and that its capacity will depend directly on the area of the surfaces and the thinness of the non-conductor separating them. It also depends on the material of the non-conductor—glass, for instance, has a greater capacity than the same thickness of air.

If the non-conductor—or dielectric—is too thin, sparks will pass between the plates, and if glass is used it may be pierced or shattered when charged from a powerful electric machine. The Leyden jar is probably the most familiar form of condenser, and in its simplest form is merely a glass bottle coated inside and out with tinfoil for about two-thirds from the bottom; a wire passing through the cork makes connection with the inner coating. The unit of capacity is called the *farad*, and is that capacity which is charged to one volt by a current of one ampère flowing for one second. A condenser having a capacity of one farad would be an enormous affair, and unnecessary for any purpose.

The millionth part of a farad—microfarad—is the unit usually employed, and standard condensers in fractions or multiples of this can be obtained. The Leyden jar is not the most convenient form for all purposes, and for practical use they are generally made up of sheets of tinfoil separated by slightly larger sheets of glass or waxed paper, building them up to any desired number, and arranging that alternate sheets of foil are all connected together at one end, while the rest are all joined up at the other end. In this way a large capacity can be obtained within a small space. The importance of a condenser will be appreciated when we come to study the working of the induction coil—the most generally useful and popular method of exciting our X-ray tubes to action.