In this work phase transformations in metastable β Ti-15Mo alloy were studied using electrical resistivity measurements. The alloy was subjected to a solution treatment at a temperature higher than β-transus and quenched in water. In this condition, the microstructure of Ti-15Mo alloy consists of a metastable β - matrix and ω-phase particles. During in-situ electrical resistivity measurement in a specially designed furnace, significant temperature points which indicate phase transformations in the material were detected. The dependence of electrical resistivity on the temperature changes during heating between increasing and decreasing according to the ongoing phase transformation. The changes were observed at temperatures 225, 356 and 560 °C. A further study of these phase transformations using electrical resistivity measurements was performed on various heat treated specimens. In order to control the microstructure evolution in the material, scanning and transmission electron microscopy was used. Mechanical properties were studied using Vickers microhardness testing. The obtained results serve to identify the type and sequence of phase transformations which take place in the Ti-15Mo alloy.