Ultracold fermionic atoms placed in a synthetic magnetic field arrange themselves in Landau levels. We theoretically study the optomechanical interaction between the light field and collective excitations of such fermionic atoms in synthetic magnetic field by placing them inside a Fabry-Perot cavity. We derive the effective Hamiltonian for particle hole excitations from a filled Landau level using a bosonization technique and obtain an expression for the cavity transmission spectrum. Using this we show that the cavity transmission spectrum demonstrates cold atom analog of Shubnikov–de Haas oscillation in electronic condensed matter systems. We discuss the experimental consequences for this oscillation for such a system and the related optical bistability