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I will present a new second-order well-balanced central upwind scheme for the Euler equations of gas dynamics with gravity. In many physical applications, the solutions of these systems are small perturbations of the steady-states and resolving these perturbations numerically may not be computationally affordable when the size of the perturbations is smaller than the size of the truncation error. We have developed a well-balanced scheme that exactly preserves some steady-state solutions of the system and thus handles the perturbations accurately and efficiently. The construction of the scheme is based on a special piecewise linear reconstruction of the equilibrium variables instead of conservative ones, as well as a modified evolution in time. We demonstrate a number of examples to show that the new scheme is well-balanced and is capable of capturing small perturbations of the steady-state on a coarse grid both in one and two dimensions. (Received September 22, 2015)