The rotation–vibration states of Ne₂XH (\( \tilde{\Sigma}^2 \)) are obtained by variational calculations. The potential energy surfaces are described by a sum of the Ne–HX empirical potential surface developed by us\(^a\) and the Ne–Ne potential of Aziz.\(^c\) In these calculations, the orthogonalized satellite coordinates are used in order to properly describe both the T-shaped and linear geometries of the complexes. The ground states of the Ne₂XH complexes are localized in the region of the potential that corresponds to the T-shaped geometry with the hydrogen atom pointing toward the center of mass of neon dimer. In the case of Ne₂OH, there are low lying states that are localized in the region of the potential that corresponds to the linear Ne–OH–Ne geometry. The complete rotation-vibration energy level progressions of Ne₂OH and Ne₂SH are presented. Comparisons with available experimental data and previous diffusion Monte Carlo results are also made.