$$\begin{array}{ccc}
\mathbf{P}_1 & \xrightarrow{\mathbf{J}_1} & \mathbf{S}_1 \\
\mathbf{f}_{\downarrow} & & \uparrow \mathbf{g} \\
\mathbf{P}_2 & \xrightarrow{\mathbf{f}} & \mathbf{S}_2
\end{array}$$