$$\begin{array}{ccc}
\mathbf{P}_1 & \xrightarrow{\ f_1\ } & \mathbf{S}_1 \\
 & \mathbf{Rel} & \\
f \downarrow \ \mathbf{Rel} & & \mathbf{Rel} \downarrow g \\
 & \mathbf{Rel} & \\
\mathbf{P}_2 & \xrightarrow{\ f_2\ } & \mathbf{S}_2
\end{array}$$