To simplify the notations, we shall work in the (sufficiently typical)
case $n = 3$.
Let $E =$
0 0 1
0 1 0
1 0 0
and let α be the inner automorphism of A defined by E (with $\alpha^2 = \text{Id}_A$). An easy calculation shows that

$$\alpha \begin{pmatrix} a & b & c \\ d & e & f \\ g & h & i \end{pmatrix} = \begin{pmatrix} i & h & g \\ f & e & d \\ c & b & a \end{pmatrix}$$

In particular, α restricts to a ring isomorphism from R to S.