define omit

Let A, B be monoids. A map $f\colon A \to B$ is *multiplicative* if for all submonoids $C, D \leq A$ such that C omits D and D omits C, $f(cd) = f(c)f(d)$ when $c \in C, d \in D$.

Let $A = B = \langle a, b \rangle$. Is the map $f\colon A \to A$ such that

$$f(x) = \begin{cases} ax & \text{if } x = ay \text{ for some } y \in A \\ x & \text{otherwise} \end{cases}$$

a multiplicative function?