A gold version of Dirichlet’s bronze approximation theorem.

Call a reduced fraction $\frac{p}{q}$ bronze, silver, or gold with respect to an irrational number $\omega$ if $|\omega - \frac{p}{q}|$ is less than $\frac{1}{q^2}$, $\frac{1}{2q^2}$, and $\frac{1}{\sqrt{5}q^2}$, respectively. Dirichlet proved that there are an infinite number of bronze fractions for $\omega$, and Hurwitz proved the same result with respect to gold. More recently, W. Bosma discovered a recursion generating only silver or gold fractions. We present a similar recursion generating only gold fractions. (Received September 13, 2019)