A box beam is made of two 1 × 6-in. and two 1 × 4-in. planks nailed together as shown. The beam is subjected to a vertical shear \( V = 500 \) lb. Knowing that the allowable shearing force in each nail is 180 lb, determine (a) the largest permissible spacing \( s \) of the nails, (b) the corresponding maximum shearing stress \( \tau_m \) in the beam.

\[
2 (180) = \frac{500[1(6)(2.5)]s}{\frac{1}{12}(6^4 - 4^4)} \\
so s = 4.16 \text{ in.} \tag{5}
\]

\[
\tau_m = \frac{500[3(6)(1.5) - 2(4)(1)]}{\frac{1}{12}(6^4 - 4^4)(1+1)} = 54.8077 \\
\tau_m = 54.8 \text{ psi} \tag{5}
\]