Elimination of Connectives

In classical propositional logic, the connectives $=$, $\vee$, $\neg$ can be replaced by $\longrightarrow$, $\wedge$, `False`. Define corresponding simplification rules as lemmas and prove their correctness. (You may use automated proof tactics.)

lemma `equiv_conel:` `"(A = B) = ((A` $\longrightarrow$ `B)` $\wedge$ `(B` $\longrightarrow$ `A))"`
  by `iprover`

lemma `or_conel:` `"(A` $\vee$ `B) = (`$\neg$ `(`$\neg$ `A` $\wedge$ $\neg$ `B))"`
  by `blast`

lemma `not_conel:` `"(`$\neg$ `A) = (A` $\longrightarrow$ `False)"`
  by `blast`

What is the result of your translation for the formula `A` $\vee$ `(B` $\wedge$ `C) = A`? (You can use Isabelle's simplifier to compute the result by using the simplifier's `only` option.)

Stating `A` $\vee$ `(B` $\wedge$ `C) = A` as a lemma and application of
`(simp only: equiv_conel or_conel not_conel)`
results in the simplified goal
`(A` $\longrightarrow$ `False)` $\wedge$ `((B` $\wedge$ `C` $\longrightarrow$ `A)` $\wedge$ `(A` $\longrightarrow$ `B` $\wedge$ `C)` $\longrightarrow$ `False)` $\longrightarrow$ `False.`