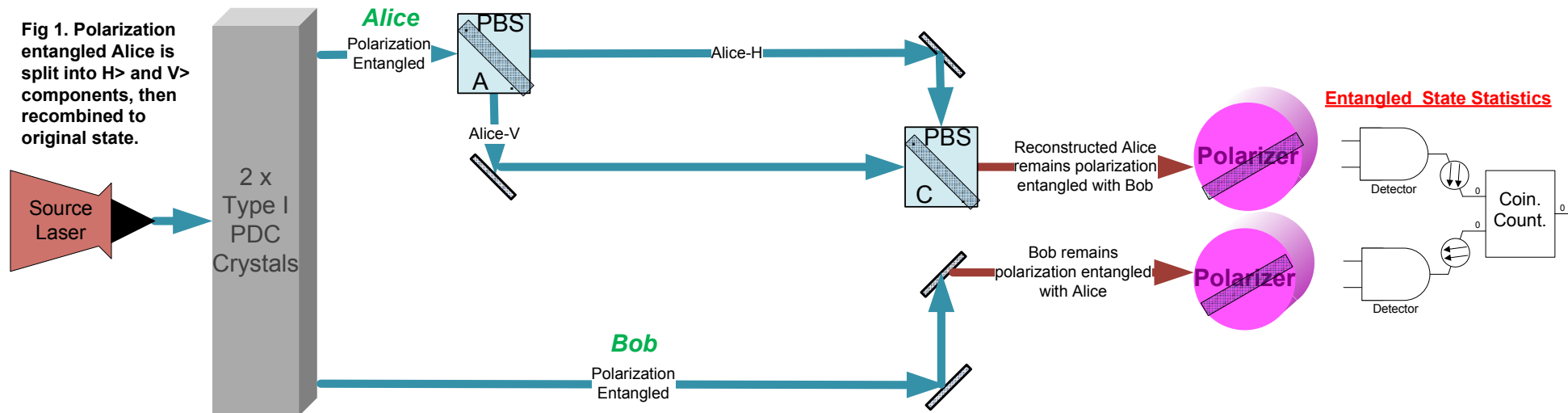


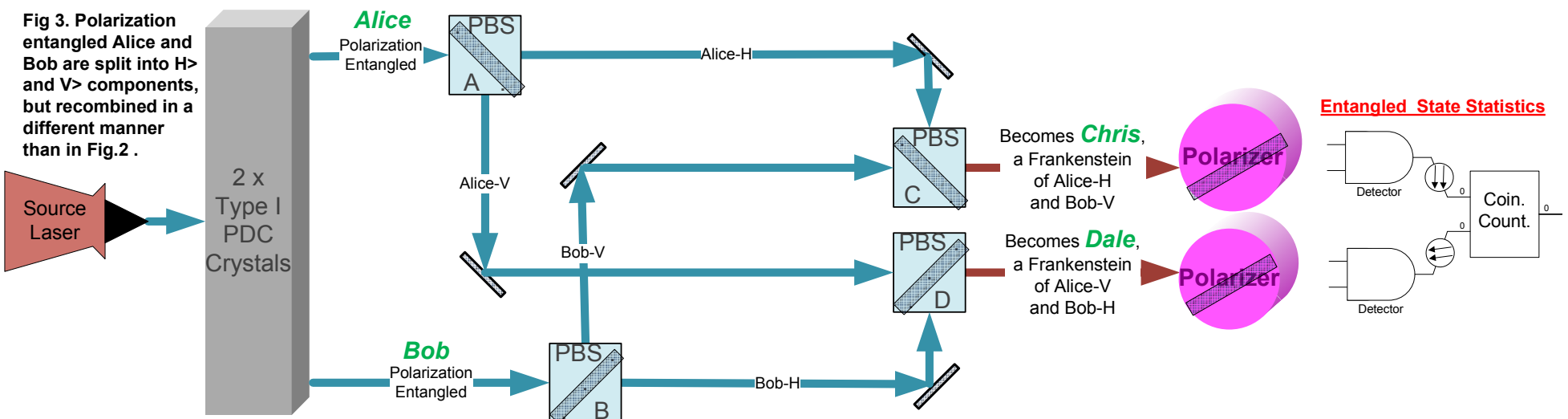
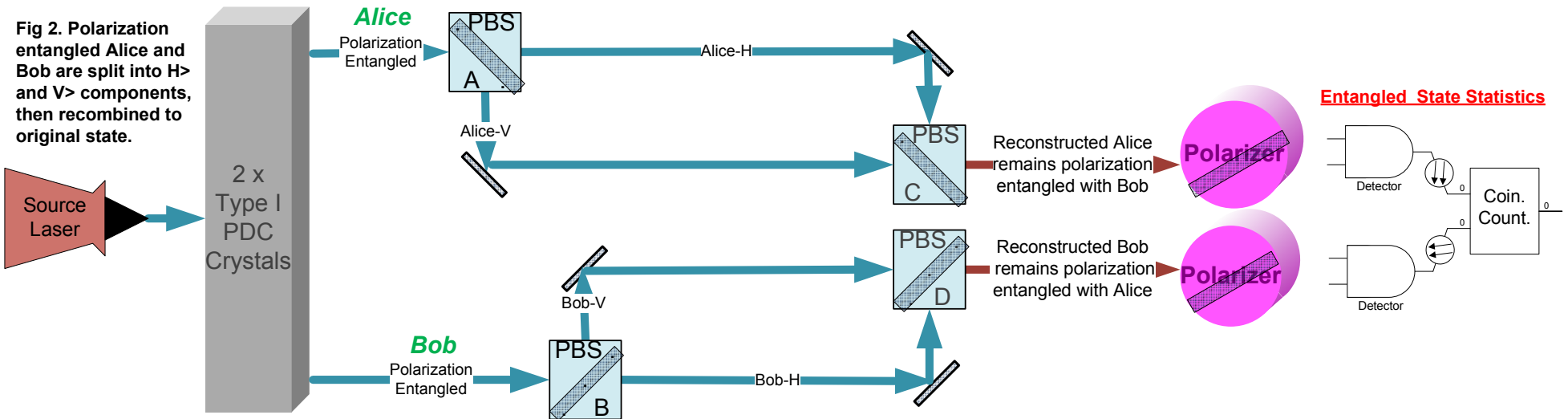
Eberly's "Bell Analyzer Loop" Maintains Alice's Entangled State

Fig 1. Polarization entangled Alice is split into H> and V> components, then recombined to original state.



(See next page for Fig.2 and Fig. 3.)

Creating Entangled “Frankenstein” Photons: Is this possible?



Figures 2 & 3: After emerging from Polarizing Beam Splitters (PBS) A and B, Alice-H and Bob-H are identical, as are Alice-V and Bob-V. PBS C and D act as reverse beam splitters, and recombine their H> and V> inputs to a single beam (when properly adjusted for path length and phase). In Fig. 2, we see that the Alice and Bob components can be recombined in PBS C and D to “erase” the polarization measurement made when going through PBS A and B. In Fig. 3, it is shown as possible to re-arrange these H> and V> outputs of Alice and Bob in such a way as to create “Frankenstein photons” Chris and Dale. Each would be a superposition of Alice and Bob (one H> and V> component from each, as in Fig. 2).

Chris and Dale are superpositions of H> and V> no different than the original (and recombined) Alice and Bob are in a superpositions of H> and V> (as in Fig. 2). They will be polarization entangled even though they originated as “pieces” of different photons! It must of course be impossible, in principle, to determine which path the photons traversed to the detectors. Then there should be no difference between Fig. 2 and Fig. 3 as to results, both Bell State correlated. What would you expect to see, according to theory?