gards complete cohesion, and the tendency to crystallization under the welding heat, not being fully destroyed by subsequent hammering and working.

The whole process of the manufacture and refinement of iron, is based upon the principle that disconnected pieces of iron brought in contact under intense heat, but without complete fusion, and subjected to violent compression, as by hammering or rolling, will unite, and become a single piece or mass.

Every bar of refined iron found in the iron market, is composed of half a dozen or more parts, which were once separate and disconnected. Those having been “fagoted,” or placed in juxtaposition, and submitted to a welding heat, and passed repeatedly between ponderous rollers, or subjected to the blows of heavy hammers, are united and drawn into bars of required sizes and forms for use.

These masses, taken from the furnace and suffered to cool without hammering or rolling, would be found more or less crystalline and brittle. But the latter operations prevent such a result, and the iron becomes more or less soft and flexible, even in a cold state.

Iron which has undergone the uniform process of rolling, is generally of uniform quality and strength throughout the whole piece; and, as far as it can be used in that state, without re-heating and re-working, it may be regarded as somewhat more reliable than when it has been forged and welded into different and more complex forms.

The high temperature required in welding, demands experience and judgment in determining the proper time to “strike,” that is, when the metal is hot enough to adhere firmly, but not overheated to burning. Moreover, though the hammering required to bring