

straight or curved line forming the edge occurs, as Fig. 3b, "the bit is said to be 'backward' and when one of the corners is too far back, as Fig. 3c, it is spoken of as 'odd cornered.' Either of these defects causes the force of the blow to be thrown upon a portion only of the edge, which is thereby overstrained and liable to fracture."

#### SHARPENING TOOLS.

Professor Ihlseng in his "Manual of Mining" says: "The best fuel for blacksmithing may be a slightly caking coal, giving flame and high heat. Coke is hotter but harder to keep fire in. The fuel should be as free from sulphur as possible. White ash coal is better than red ash; sulphur makes the iron hot short, and tends to produce scales. The coal should be clear of shale or slate, for they fuse and make a pasty cinder that is annoying."

A prospector away from civilization may have to use wood; in that case he should use chips, and blow them with a portable bellows.

The prospectors who try to get along on as small an outfit as possible usually take one to three blasting powder cans and cut the heads out of all but the bottom one, and one head of that must be cut out; these they place one on top of the other to make a furnace. They punch an inch and a half hole in the side of the bottom one at the bottom for draft, and to put in the points of the tools to heat them.

They use charcoal for fuel and then a chunk of steel or railroad iron about 6 inches long serves for an anvil. Some take a small bellows and anvil with them. For tempering drills they give the drill, when red, a plunge in water. After two or three rubs on wood, to brighten it, they hold it up to the light and watch it until it takes on a straw color. Then they dip it in water again. For picks a blue color is the most satisfactory in general.

"Steel is a compound of iron and carbon, and its homogeneity and presence of carbon impart to it a capability of hardening and tempering to a degree depending on the temperature of the heating and subsequent cooling. As the amount of carbon increases, the melting point of the iron decreases, and this greater fusibility reduces its welding quality.