as much as possible It is generally best to place them in an oven built on top of a core oven or at some other point where waste heat can be utilized If not all crucibles in stock can be kept in ovens, those stored elsewhere should be accurately dated and the oldest and best-seasoned crucibles should be selected first

In the annealing process, the crucibles are brought up to red heat very slowly and uniformly, usually over a period of eight to ten hours Crucibles should not be allowed to cool before being charged, because as they cool they may again absorb moisture Moisture in the walls of crucibles that are heated quickly is converted into steam, which expands and causes cracks or ruptures and may also cause pinholes or "skelping" Neither damp or high-sulfur coke or coal nor fuel oil containing excessive moisture should be used to heat crucibles

Too high a percentage of sulfur in the fuel used in the drying or annealing process is likely to cause fine cracks, sometimes called "alligator cracks" Too little oil or too much air or steam used at the burners of oil furnaces tends to oxidize a portion of the graphite in the crucible wall, leaving the binding material somewhat porous

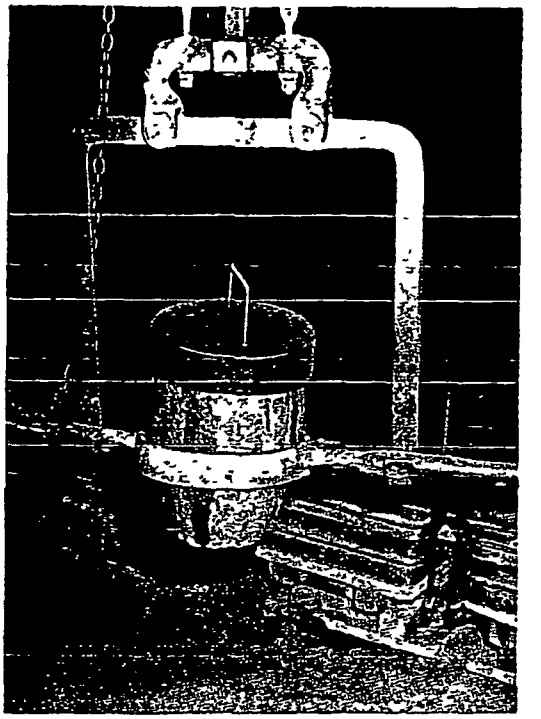


FIG 28-9 —Mechanical lifting device is used to move crucible, which has been covered to prevent escape of fumes

Courtesy American Brake Shoe Co

Charging and handling

Proper care of crucibles is good economy as well as good safety Since crucibles are costly, they should be made to last through as many heats as possible

Crucibles should be charged carefully Ingots should not be thrown in with such force that they may bend the bottom or walls of the crucible out of shape Neither should the ingots be forced into the crucibles so as to become wedged or jammed

New crucibles should be heated very slowly for the first few runs, especially the first Because crucibles are soft at white heat and easily forced out of shape, they must be handled with great care

In hoisting larger crucibles with air or electric hoists, it is preferable to have one man at each sling and one man controlling the hoist

Tongs of the proper size and shape for the particular crucible should be selected to prevent damage to it Tongs should fit well around the bilge or belly of the crucible and should extend to within a few inches of the bottom

Before tongs are applied, the sides of the crucible should be checked to see that no clinkers are adhering to them Tong rings should never be driven down tight with a skimmer or other tool, because this practice is almost certain to squeeze the crucible out of shape and produce cracks and fissures

At least two pairs of tongs should be provided for each size of crucible so that if one pair becomes bent, the other will be available

The blacksmith should have a complete set of cast iron forms in the exact shapes of the crucibles used Then he will have only to heat the tongs to red heat, clamp them onto the forms, and bring them into exact shape with a heavy hammer

Ramming of the fuel bed around a crucible should be avoided If it becomes necessary, it should be done cautiously and only by ex-