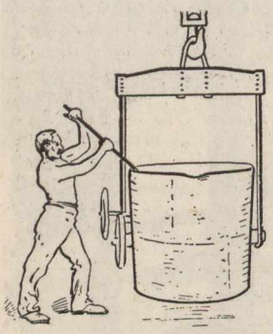
FOUNDRY ECONOMIES.

Within the last few years the use of "Thermit" in the foundry has become very popular. Through the courtesy of the Goldschmidt Thermit Co., 334 St. James Street, Montreal, we are enabled to describe and illustrate examples of its application in common foundry practice.

Reviving Dull Iron.



The intense heat developed by Thermit finds a very natural application in foundries for superheating and reviving dull iron in the ladle, thus improving the metal and guarding against defective castings.

For reviving iron in the ladle, Thermit is put up in cylindrical cans, which can be readily attached to an iron rod. The rod is thrust down to the bottom of the ladle, where the reaction takes place, the intense heat permeating the entire contents. A small can containing 1½ lbs. of Thermit is sufficient to melt 40 lbs. of steel borings in an 800 lb. ladle, in making semi-steel castings, so that one can is also sufficient to revive a ten or twelve hundred-pound ladle of dull iron.

This simple and effective method has received the highest commendation of expert foundrymen.

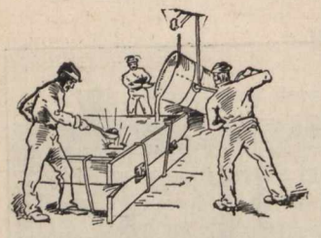
Titanium Thermit.

Titanium, when introduced into molten iron in small quantities, exerts a remarkable purifying or poling action. It unites with the nitrogen present and removes it from the metal, increases the fluidity of the iron and produces casting of exceptionally dense, close grain. It is, therefore, of especial value in casting engine cylinders and valves.

A special Thermit is prepared, containing small additions of Titanium, and packed in cans smiliar to the "semi-steel" or reviving cans. It is introduced into the ladle as before. The actual temperature of the metal is not much increased, but the ebullition of the reaction distributes the Titanium through the ladle.

The greater fluidity of iron thus treated is strikingly shown in the sketch of three thin wedges or "fluidity bars." The centre bar is a "fluidity wedge-pattern" from which two moulds were made. The first bar was poured in one of the moulds from **untreated iron.** The third bar was cast from the same ladle of iron immediately after treatment.

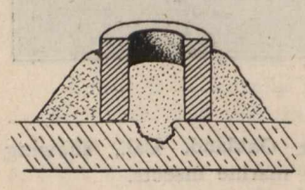
Riser Thermit.



It is often advisable to superheat or revive iron in the "risers" in making long or intricate castings. This result is easily secured by simply dropping a small package of Thermit and a pinch of ignition powder into the riser as the metal appears. The intense heat is communicated into the mould and effectually prevents cold-shuts and other defects due to dull metal.

Liquid steel will ignite Thermit. Liquid cast iron requires ignition powder.

Repairing Small Flaws in Castings.



For making very small repairs, the so-called "pouring cup" is employed—a shallow vessel, open at the bottom, which is placed directly over the flaw. The Thermit is then put into the cup and ignited. The flaw is fused out and replaced with Thermit steel. This is a simple, cheap and effective method of repairing flaws in steel castings and forgings.

The Thermit process of repairing flawed castings must not be considered as one of concealing imperfections. It is a true washing out of imperfections and replacing with perfect steel.

The ease with which intensely hot metal may be obtained anywhere almost at a moment's notice, the simplicity of equipment and manipulation have firmly established this practice in some of our most prominent steel foundries.

Repairing Steel Castings and Forgings.

A most promising field for Thermit lies in repairing flaws in steel castings and forgings. The superheated Thermit steel literally washes away the flaw, fuses the metal, amalgamates with it and leaves it perfect.

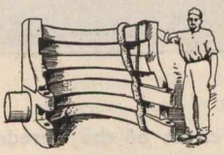
In making large repairs, where considerable quantities of Thermit are needed, the conical or "Automatic" crucible is used, supported on a tripod or stand, and tapped from the bottom, as already described and illustrated.

Where smaller quantities of Thermit are required, a flat-bottomed crucible is used, handled by tongs, like the small foundry ladle. After ignition, the slag is decanted or poured off and then the steel run into the mould.

The illustration shows this method as employed in repairing a flaw in a large steel ingot.

General Repair Work.

Thermit finds an extensive field in general repair work of steel, and even of cast iron. The accompanying sketch of an enormous steel gun-cradle welded by Thermit illustrates the possibilities of this method.



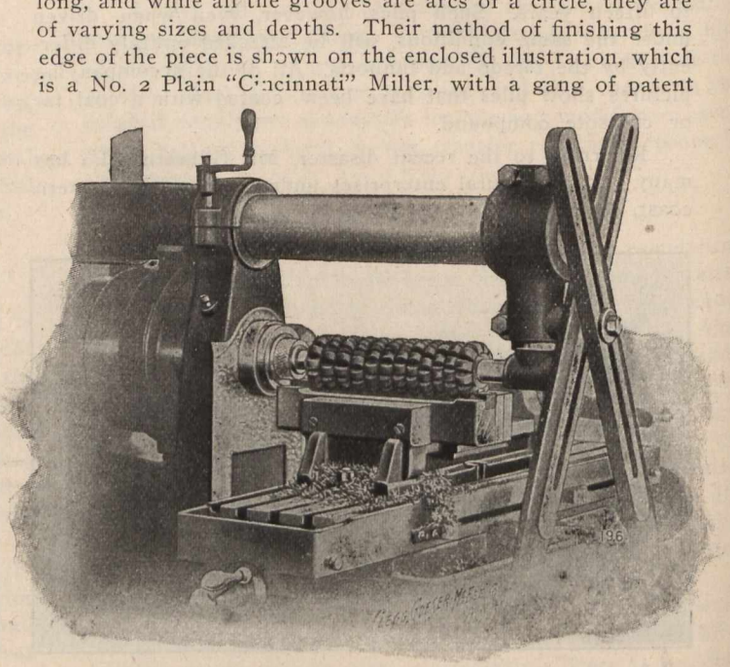
❧ ❧ ❧

MACHINE SHOP NOTES FROM THE STATES.

By CHARLES S. GINGRICH, M. E.

XXVI.

The Ohmer Fare Register Co., Dayton, Ohio, use in their device a malleable iron bar, one edge of which has a series of grooves its entire length. The bars are 12 in. long, and while all the grooves are arcs of a circle, they are of varying sizes and depths. Their method of finishing this edge of the piece is shown on the enclosed illustration, which is a No. 2 Plain "Cincinnati" Miller, with a gang of patent



relieved cutters 3½" diameter, forming a gang 12" wide, so that with the bars held in a vise adapted for the purpose, the entire edge of the piece is milled at a single cut.

The total amount of time required for the operation is, of course, very small, but would be exceedingly tedious and difficult if attempted on any other machine except the miller. It is a job for which one might say, the milling machine is especially adapted, and because of the great length of the cut it serves to illustrate what can be accomplished on comparatively small machines.