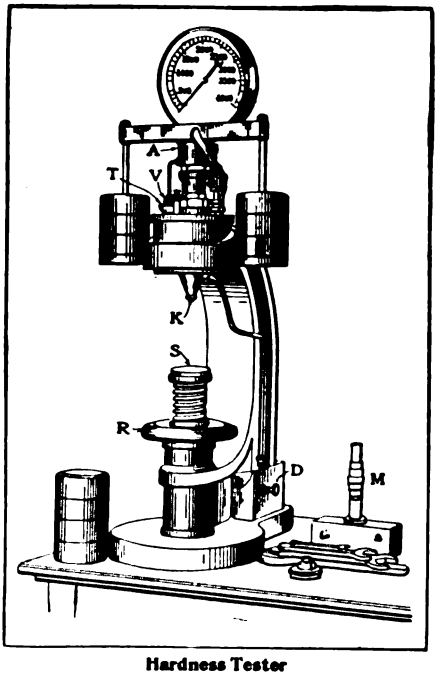
MACHINE FOR TESTING HARDNESS

One of the most important properties of cast iron is its hardness. An iron which is too hard is brittle, weak and more difficult to finish and the results are inferior to those obtained when soft iron is used.

In order to determine the degree of hardness various machines have been designed,



Hardness Tester

some of which depend on the impact of a sharp-pointed object or the effects of scratching, and others on the effects of an ordinary twist drill. In the last named machines a given size drill with a constant pressure applied will make a hole of a given depth in a certain number of revolutions, the number of revolutions determining the hardness of the iron or other material that is being tested.

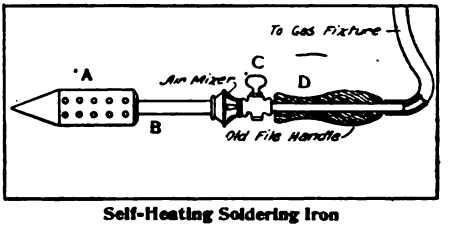
The machine which is herewith illustrated, by courtesy of the American Machinist, is one which was recently invented by a Swedish engineer, and is regarded by leading technicians as the most reliable machine of its kind that has ever been devised. In this machine the degree of hardness of any substance is measured by the amount of indentation caused by the pressure of a hardened steel ball on the sample to be tested. The pressure is obtained by means of a small hydraulic press, operated by a hand pump, and connected to a gauge which indicates the amount of pressure that is being applied.

A small auxiliary cylinder A, supports a beam on which are suspended a number of weights. These weights are changed to suit the material to be tested, and when the pressure passes a certain point they are raised, thus preventing any excess over the desired amount.

When a sample is to be tested it is placed on the end of the screw S, and the wheel R is then turned until the sample is brought against the steel ball K. The necessary pressure is then produced by working the pump, after which the sample is removed and placed under the microscope M, which has a lens engraved with a scale which is always visible, and thus allows measuring the exact size of the indentation. In order to get the most accurate results the surface of the sample should be polished. After obtaining the exact size of the indentation produced by a given pressure the hardness can be obtained from a table which gives the value in standard degrees.

HOW TO MAKE A SELF-HEATING SOLDERING IRON

A good self-heating soldering iron, having nearly all the advantages of an electric soldering iron, can be easily made by using the devices shown in the accompanying sketch. A is the copper head of an ordinary soldering iron, and is drilled with ⅛-in. holes on the sides as shown. It is also drilled to receive the ¼-in. pipe, B, which is screwed into the air mixer. The stop cock, C, can be omitted if desired, but is very handy when the gas fixture is high and not easily reached. A ⅛-in. pipe, D, is pushed through an old file handle drilled for the



Self-Heating Soldering Iron

purpose, and connects with the hose as shown. The air mixer can be taken from an old Wellsbach light.

When the gas is turned on and lighted and the air mixer properly regulated, a blue flame surrounds the copper and keeps it at just the right temperature.—Contributed by Edw. J. Snyder, Buffalo, N. Y.