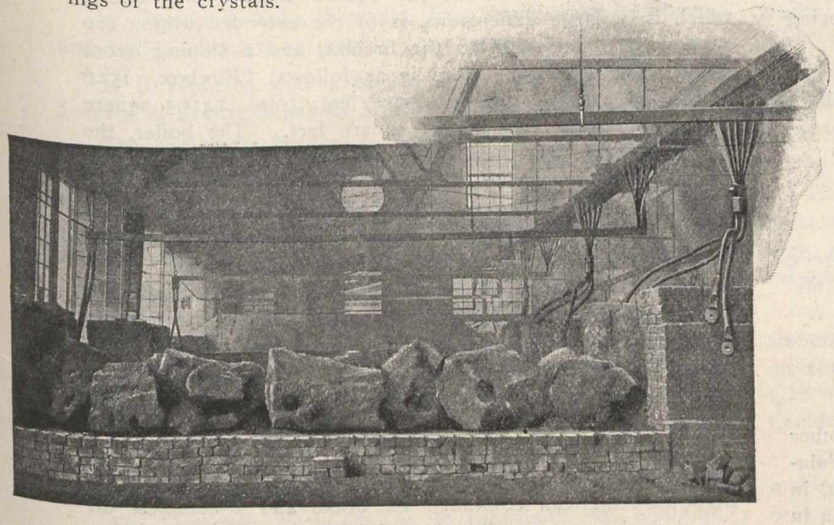
volved by other methods of opening and closing circuits carrying such large currents. The resistance of the core being always greater when the carbon is cold, the voltage is first raised to overcome this. As the volume of current continues to increase, the regulation is run back, reducing the voltage, until finally the resistance of the core becomes constant and little regulation is required, the amount of power used on the furnace being 746 kilowatts or 1,000-h.p.

After the current has been on half an hour, a peculiar odor, due to escaping gases, is perceived, and at the end of three or four hours the furnace walls and top are enveloped by a lambent blue flame of carbon monoxide gas, formed by the combination of the coke with oxygen of the sand. During the run of a single furnace, five and a half tons of this gas are given off. At the end of four or five hours the furnace top gradually subsides, and fissures form along the surface out of which pour the yellow vapors of sodium. At the end of thirty-six hours, the current is cut off and the furnace is allowed to cool. Then the side walls are taken down, the unchanged mixture raked off, and the outer crust of amorphous carborundum removed. The inner crust is then removed and the crystalline carborundum, of which a single furnace yields about 7,000 lbs., is exposed.

After the carborundum has been removed, it is taken to a crusher, which breaks the mass of crystals apart. Then it is taken to tanks and treated for several days in diluted sulphuric acid to remove impurities, after which it is washed, dried and graded. There are twenty grades of crystals, and three grades of flour, the latter being the fine power washings of the crystals.

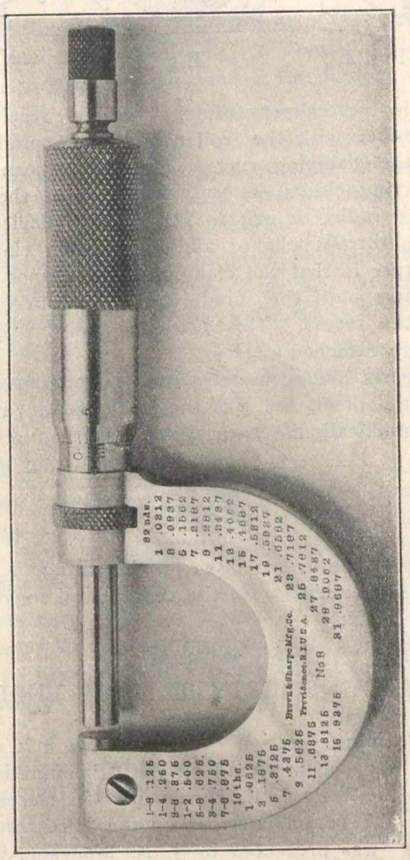


Carborundum Furnace after Burning.

Carborundum is infusible, and is also insoluble in water or acid. Its hardness approaches that of the diamond, it being almost impossible with a microscope to distinguish lines scratched on plate glass by carborundum from those of the latter. Its specific gravity is 3.123, or about 20 per cent. less than that of emery. The most interesting application of carborundum as an abrasive is in the form of wheels into which it is made in diameters varying from 1 to 36 inches, and in thickness from ¼ to 4 inches, besides wheels for special purposes such as dental, cylinders, cup wheels, roll-grinding wheels, saw-gummers, moulding wheels, etc. It is also made into knife sharpeners, hones, scythe, axe and sharpening stones, cloth, paper, etc. As compared with emery, it is claimed that it will do more work, better and faster. Watchmakers use it in place of diamond. One firm found that while emery wheels would grind about 65 rolls before becoming useless, carborundum wheels would grind 220. In regard to the tendency of these wheels to burst, it is claimed that they are safer than any other class of abrasive wheels. As confirming this statement, it is on record that at a scientific test of over sixty grinding wheels, all of which were 20 inches in diameter, conducted at the Technical High School, Dresden, an ordinary carborundum wheel attained a speed of 4,340 revolutions per minute before bursting, which was the best record made by any of the sixty wheels tested. As the proper operating speed of this size wheel, is 955 R.P.M., the factor of safety is shown to be very great.

MICROMETER CALIPER CLAMPING DEVICE.

Brown & Sharpe Mfg. Co., Providence, R.I., have recently placed upon the market an Improved Clamping Device for Micrometer Calipers, which is much superior to the clamping nut furnished heretofore. The device is simple in construction, and only a slight movement of the knurled ring is required to clamp the measuring spindle firmly. It is often desirable after taking a measurement to lock the spindle securely in the position in which the measurement was taken for reference when a large number of pieces are to be measured. Should the spindle be rotated or moved longitudinally, the accuracy of the original measurement would be destroyed, but in the construction of this clamping device, the possibility of disturbing the adjustment is entirely avoided. Another excellent feature of this device is that the tension on the spindle can be adjusted without disturbing the adjustment of the threaded portion of the screw and



nut. This is a valuable feature when measuring a number of pieces for comparison as sufficient tension can be put on the spindle to prevent its turning when the work is passed between the measuring points, and at the same time the spindle can be left sufficiently free to allow of slight adjust-

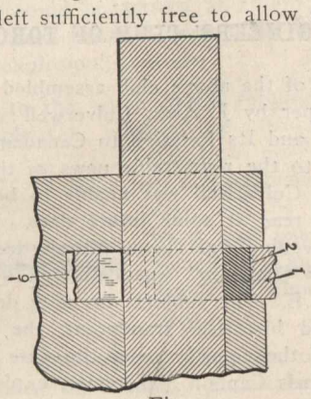


Fig. 1.

ments. When the clamping ring has been set to exert a certain tension, the rotation of the spindle cannot alter the setting of the tension for the reason that the clamping ring is held stationary and forms part of the bearing for the spindle. Referring to the cuts, figures 1, 2, 3, and 4, the operation of the mechanism is as follows: The split clamp ring 2, figure 2, fits the measuring spindle with a sliding fit when open, thus measuring a longer bearing for the spindle than