two ounces of charcoal, put into a crucible and heat to a white heat. I then add thereto sixty pounds of copper. Heat till both are melted together, then add four ounces of borax and thirty-eight pounds of zinc.

The mode of proceeding during the melting is much the same as with all other metals melted in crucibles. When melted it may be poured into molds or bars suitable for the forge or rolling mill. Its strength is estimated to be eight thousand pounds greater to the square inch than the best wrought iron, rendering it far more valuable for various purposes.

The proportion of parts may be varied, which will only change proportionably the desired effect, viz., greater amount of strength and solidity; but I believe that the proportions about as described will be best for all practicable purposes. I have described its component parts and the mode of proceeding to produce my improved composition, so as to enable a person skilled to make the same.

What I claim therefore, and desire to secure by letters patent, is the introduction of cast iron into a composition composed of copper and zinc in about the proportion, substantially in the manner as described.—*Scientific American.*

Mysteries of making chewing Gum.

A great many American girls as well as boys have acquired the particularly disagreeable habit of chewing gum. We will tell them how gum is made:—"The greatest gum-manufacturing establishment is at Podunk, Mass.; and the fame of the gum (and the gum itself) is 'in the mouths' of many. One of the employees of that establishment, who has become thoroughly initiated into the mysteries of the manufacture of the gum, was recently discharged from the establishment, and has divulged the mode of making the gum which these young Americans masticate with such velocity and apparent satisfaction. The gum is made of certain parts of gum-arabic, gum-tragacanth, a small quantity of resin and *fat*. The fat used is not lard (that being too expensive), but it is a substance expressed from the bodies of hogs, cats, dogs, and other animals found dead in the streets of cities. After the various ingredients are melted together in a huge kettle, a certain kind of alkali is put in, for the purpose of whitening the gum. This alkali is the same that is used by dyers with indigo to give a deep permanent blue to flannels."—*Exchange.*

Glycerine Soap.

Hitherto, in order to manufacture soaps containing glycerine, and having a more or less transparent character, ordinary soaps had been shredded and dried and then dissolved in alcohol. With these alcoholic solutions comparatively small proportions of glycerine have been mixed or combined, and then the alcohol has been distilled or driven off by heat.

An invention patented by Mr. George Payne, of the Belmont Works, Battersea, London, consists in a mode of manufacturing what are termed "transparent soaps," by which comparatively large proportions of glycerine may be combined with the soaps employed, and at the same time the costly process of dissolving dry soaps in alcohol dispensed with. For these purposes common soaps are shredded and are then introduced into or immersed in glycerine and subjected to heat for several hours, by which the soaps are dissolved. The ingredients are stirred from time to time in order that the mixture or combination may be complete. In carrying out this invention, Mr. Payne uses what are known as "fitted" soaps; they may be taken either in the fluid state as they come hot from the coppers, or the soaps may be shredded after being framed, but other soaps, however made and in whatever condition, may be used in place of fitted soap. He places 5 cwts. by weight of the soap in a copper heated by a steam jacket which surrounds it, and mixes therewith an equal part by weight of distilled glycerine; the ingredients are kept heated and are stirred from time to time until the whole of the soap is dissolved, which usually takes from eight to ten hours. The clear solution is then run off and framed in the usual manner, and it may afterwards be cut up into bars andsquares and stamped to any suitable shapes.—*Mechanics' Magazine*

The Creusot Works (France), and Industrial Education.

Creusot may be said to form a kind of model manufacturing community, all placed under the direction of a single individual or firm, and consisting of 24,000 inhabitants.

The number of workmen employed is 9,950; the steam power is equal to that of 9,750 horses. There are coal mines which produce 250,000 tons annually. There are iron mines, which produce 250,000 tons of minerals per annum; and the annual production of cast iron is 130,000 tons But it is not in the mere production of raw material that this company expends its skill. It converts its cast iron into all the forms of wrought iron employed in the manufacture of machinery, or in the construction of large engineering works. In the course of the year it turns out 100 locomotives, or about two a week. Although situated far inland, with no direct temptation to undertake naval engineering, it exhibits numerous examples of marine steam engines (one of 950 horse power nominal—upward of 5,000 actual) for the iron-clad ships of the French navy.

It seems, that, from their earliest childhood, the children, boys and girls, of the workmen at this immense establishment, are educated and trained in schools organized by M. Schneider. So far from the education which they receive putting the workman above his work, the contrary is the case; it enables him to do it more to the satisfaction of his employer, and to his own honour, and personal advancement.

The system of the instruction given at the Creusot schools is fully detailed in tables hanging on the walls of the Great Exhibition; drawings of the habitations of the workmen, their churches, their hospitals, and their schools, are also exhibited.

Statistical tables illustrate the progress and changes of the population; these are divided into two parts—the one shewing the progress of their material welfare, their accumulation of property, and their consumption of food and luxuries; the other showing the amount of attendance at schools the relative statistics of individual success in these schools, and the subsequent rank attained by each