Science Helps Lower Steel Costs

Metallurgy

One of the greatest industrial battles in years is the struggle of iron and steel manufacturers to retain a reasonable margin of profit. Scientists are bringing forth many new ideas as weapons against loss. Some of their plans, if successfully applied, may revolutionize the whole industry. Others seek to cut off a cent from the cost here and another cent there and little by little keep the production cost down.

Much money is spent by the industry for improvement. Unfortunately, manufacturers declare, in some instances cost of production is advanced so rapidly by adverse economic conditions that the profit gained through improvements can hardly keep abreast.

It is stated that one of the most substantial improvements made recently lies in the use of electricity as a source of motive power. The Youngstown, Ohio, Sheet and Tube Company is installing high pressure boilers to run electric generators at its plant. The boilers will be fired by the waste from coke ovens. Electric motors used for driving rolling mills, conveyors and other machinery are more economical because they permit the operation of one unit at a time. They increase the flexibility of the mill operation and thereby save time and labor, it is said. Plants located near sources of water power are calling upon it to furnish electricity for more economical operation.

In the struggle against advancing costs, iron and steel manufacturers are adopting a more diversified output. They are taking advantage of the fact that if the market for rods and strips slumps they can keep their mills going by turning out tinplate.

Chemists and metallurgists are eyeing the blast furnace critically. "This business of shipping iron ore from way out in Minnesota seems to be a waste of money," say some. "Why can't we ship iron instead of ore with all its impurities?"

With the use of the blast furnace, iron and steel plants must have a means of manufacturing coke. This entails the operation of a gas plant, in most cases. The University of Minnesota has been experimenting with the combination of gas plant and blast furnace. They mix the ore and put the mixture into a coke oven similar to those used in the manufacture of coal gas. They heat the mixture. The iron comes out in a crumbly form and is pressed into cylindrical blocks for shipment to steel plants. It is declared that iron produced in this manner near where it is mined costs a few cents less after shipment to Pittsburgh than iron manufactured in blast furnaces at Pittsburgh.

A process similar to this for the elimination of the blast furnace is being tried by the United States Steel Corporation in its plant at Lorain, Ohio. Metallurgists are reluctant to predict how successful this experiment will be, however.

Metallurgists are continually seeking more economical methods in the use of fuel. They have found that the admonition "cleanliness is next to godliness" holds true in the manufacture of iron and steel as well as in human life. More care is being taken with the cleaning of coke before it goes into the blast furnace. Cleaning of coke eliminates ash. As little as one per cent. of ash taken from the coke takes twenty cents off cost of production of pig iron, it is claimed.

Manufacturers are seeking greater fuel economy in the open hearth furnace where the greatest steel tonnage is manufactured. Before gas and air in this furnace reach the charge that is to be melted down, they pass through heated chambers stacked with fire brick. These chambers comprise the regenerator. In an effort to make the operation of the regenerators more efficient, the bricks are being stacked in new arrangements to get as much heating surface as possible in a small space. Bricks made of carborundum, which will withstand a higher temperature, also are being tried.

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Speed—3 Miles Plus Per Minute

Automotive Engineering

A racing car created to achieve the highest possible short spurt of speed flashed along the sands of Daytona Beach, Florida, and smashed the world's auto speed record of 203.79 miles an hour established last year by Major H. O. D. Segrave in an English-made Sunbeam car.

It was Capt. Malcolm Campbell in his famous English racing car, Blue Bird, which achieved the average speed of 206.956 miles an hour over measured mile courses, with and against the wind. His American rival was a special Stutz designed by F. E. Moskovics and piloted by Capt. Frank Lockhart.

The details of the Blue Bird have been closely guarded but it is known that it is powered with the same type of Napier engines that were used in English airplanes that last year won the Schneider Trophy race in Italy and set the world's air speed record of 281.669 miles per hour. The front of Capt. Campbell's car is carefully streamlined and its nose is suggestive of a whale. Detachable wings on its tail intended to prevent skidding give it the appearance of being about half airplane, while the radiators are placed on each side of the stern instead of in front. Airplane development contributed to the design of the Blue Bird.

One unique feature of the American car is that it is cooled with ice, eliminating radiator entirely. Engineers estimate that this saves about 60 horsepower that would be used in the cooling apparatus. Since the runs are very short, only about four or five minutes, it is possible to utilize a cooling method that would be impractical in an ordinary automobile. Elimination of the radiator reduces the wind resistance greatly and allows the nose of the car to be hermetically sealed. The car is completely streamlined, even the wheels being covered so as to slide through the air with the smallest possible effort. The wheelbase is 112 inches, the width of the car is 24 inches with a 42-inch track. Its greatest height is 42 inches at the driver's headrest while the height of the rest of the car is only 32 to 36 inches. Two powerful eight-cylinder engines each with its own crank shaft feeding into a common transmission with worm drive slung under the rear axle, furnish the power.

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