



Left: Some coils of brass, depending on the requirements of the customer, must be slit into narrow widths, as shown here. After the strips are recoiled, they are sent to the Shipping Department where they will be carefully packed. Right: One of the most spectacular operations in the Metals Division, the Tandem Mill is one of the largest "four-high" mills used in the brass industry. A brass bar or coil first enters the rolls of the mill at the left, then proceeds on through the second mill at the right where it is coiled and sent to the Roller Hearth Furnace for annealing. Annealing is necessary to soften the metal, which, as it is worked, gradually becomes harder and more brittle.

smooth surface and are visually inspected for grain size. A comparative inspection of grain structure is also made under a microscope in another test.

SAMPLES FOR INSPECTION

At the time of pouring, the Cast Shop Laboratory takes a small sample of the molten metal — which is divided into two parts. From one part, a small "pin" about the size of a pencil, is milled and sent to the spectrographic lab for inspection for impurities. From the other part of the sample, brass shavings are milled and sent to the Analytical Lab for a chemical analysis — to determine the percentages of copper and zinc and to see if they meet the specifications of the particular "mix" or alloy.

The various alloys made in the Cast Shop are identified by the percentage of zinc. For example, the alloy with which we are particularly concerned here is cartridge brass, which contains 70 percent copper and 30 percent zinc and is therefore referred to as "30 Mix."

BAGGING SMOKE

An interesting side-light in the Cast Shop is the "smoke-bagging" operating. Zinc oxide, formed in the air over the molten metal in the furnaces as a result of the combination of some of the zinc from the batch with oxygen, is drawn off into hoods — from which the zinc oxide-laden smoke is piped through traps and a filtrator, where it is sedimented as fine gray powder and is put into bags for reclaiming. Hence the expression, "bagging smoke".

At just the right moment, the furnace men pour the beautiful blazing metal, tilting the furnace gradually by a hydraulic mechanism, timing the job perfectly in order to produce a flawless bar of

metal. Each pouring is referred to as a "round", whether it amounts to one or two bars.

After cooling, the bars are removed to the giant shearing press, where the ragged, shrinkage-pocketed ends are sliced off. For the larger bars the ends are sawed off on a large circular saw. Bars are cast in various sizes, dependent upon physical characteristics of metal to be cast and the size of coil required.

TO THE ROLLING MILL

Now the brass bar is ready for the Rolling Mill, and it will travel from the Cast Shop through various rolling and annealing operations in the Mill before being sent to Shipping, perhaps stopping off at Slitting on the way for conversion into narrower strips, winding up as a shiny coil of metal ready for packing.

The mill procedures vary for the different types of brass alloys being processed, and they will also vary according to the end use to which the brass will be put. But since we are primarily interested in cartridge brass, or "30 Mix", in this article, let us consider the procedure in handling this alloy — a somewhat shorter and simpler procedure than in cases where metal will be rolled down to a very thin gauge, perhaps in the neighborhood of four-thousandths of an inch (.004). Cartridge brass is much heavier and therefore requires less processing.

THE HOT MILL

The first stop for the brass bar as it comes from the Cast Shop is the Pusher Slab furnace, just opposite the Hot Mill. Automatically handled from the first, the bars move through the furnace, staying inside for about two hours. Emerging red-hot from the furnace, the bars are discharged onto a roller-conveyor, which at the push-button control