

furnaces are drawn by a special ventilating system into the "Cottrell Precipitators". The flue gases carry gold, silver, and other metals in suspension. The precipitators, by means of an electrical process, extract the metals in the form of a fine powder, which is collected, sampled, assayed, and sold to smelters.

In 1938, 6,913 deposits were received having a gross weight of 5,601,257 ounces. The rough gold received weighed 4,671,147 ounces, the average assay being: gold, 743.0; silver, 143.8; base metals, 113.2. The number of fine gold trade bars produced was 10,967, weighing 4,420,379 ounces with an average fineness of 996.87. Granulated gold, produced for sale to manufacturing jewellers, etc., had a gross weight 12,395 ounces, with an average fineness of 999.84. The capacity of the refinery is approximately 140,000 ounces of fine gold trade bars per week. A record was kept, some years ago, over a period of nine months, of the recoveries of gold from the refining of rough gold containing 474,000 ounces fine gold. The percentage recoveries were as follows: gold in the form of trade bars, 98.357; gold in silver 'buttons', 1.504; gold in flue dust, slags, etc., 0.135; gold not recovered, 0.004. The output of silver is approximately 20,000 ounces per week.

Coinage Methods.—The ingots used for coinage must be of a purity of 999 parts per 1,000, or over. These ingots are placed with the necessary alloys in crucibles and are charged into the melting-furnaces where the metals are thoroughly mixed. The flues of the furnaces are so arranged that the gases issuing from the furnaces enter a large condensing chamber where any fine particles of metal that may be carried from the furnaces are removed from the air before it reaches the chimney stack. When the metal is ready for pouring, it is cast into bars about 24 inches long, $\frac{1}{2}$ inch thick, and varying in width from $1\frac{1}{4}$ inches to $2\frac{1}{4}$ inches according to the denomination of the coin to be made. The bars cast from each crucible are kept separate and marked distinctively, so that their origin can be readily traced at any time. In the case of gold or silver bars, a small piece is cut from one end of the first and of the last bar from each crucible, and these pieces are forwarded to the Assay Office for testing. The bars are not used until a report from that department has been received stating that they are within the legal standard as to fineness. All bars above or below this standard are remelted with the necessary amount of alloy, or fine metal, to bring them to standard.

From the melting-house, the bars go to the rolling-mills where they are rolled into long thin strips or fillets. There are three of these mills: the breaking-down mill, through which the bars pass about twenty times; the thinning mill, through which they pass about ten times; and finally, the finishing mill, where, after being passed through about eight times, the bars are reduced to correct thickness for the coin that is to be made. In the finishing mill, the adjustment of the rolls can be made as fine as 0.0002 inch.

In the case of silver and bronze, the fillets pass from the finishing mill to the blank-cutting machines, but in the case of gold it is found that further adjustment is necessary. This is done by drawing the gold fillets between two steel cylinders that can be adjusted to a space of 0.0001 inch. Blanks are then cut from the fillets and the skeleton of the fillet is sent back for remelting.

The blank coins are then put through a marking machine which puts pressure on the edges, raising them and forming a protection for the impressions that are to be made on the blanks in the coining process. Before coining, however, the metal must be rendered ductile as it has been hardened considerably by the rolling, cutting, and marking processes. This is accomplished by annealing—heating the metal