livered as coin in fourteen days after its arrival, and the thirdthird in eighteen days.

But as there is a bullion-fund of \$5,500,000 allowed by government, depositors are paid from the third to the fifth day after an arrival, *i.e.*, as soon as the gold is melted, assayed, and its value calculated. When two heavy arrivals occur in close succession, the time of refining and coining can be shortened from 14 to 10 days.

The number of men engaged in the refining department is 14: 1 foreman, 8 for the parting process, 3 for reducing, and 2 for pressing and drying. In the gold melting-room there are 3 melters and 2 assistants. The total number of hands in the melting and refining departments is 34, including a melting and parting foreman, and 3 in the place for grinding, sifting, washing, and sweeping. This last place or sweep embraces all pots, ashes or fires, triumnings of furnaces, ashes of all woodwork, &c.

The late law for reducing the weight of silver coin necessitated an increase of force, and 15 more were in consequence employed for this purpose. While \$50,000,000 in a year have been parted with the above force, they could with the same force and apparatus refine \$80,000,0000 if it were required.

After many experiments upon anthracite, Professor Booth stated that he had *ct* length fully succeeded in employing it for melting both gold and silver in the same furnaces, slightly modified, in which he had been accustomed to melt with charcoal. This change had been accompanied by great economy in the cost of material and labour, and by greater comfort to the workmen, from being les exposed to heat. The cost of charcoal (of the best quality—hard pine-knot coal) is 16 cents per bushel, delivered at the Mint; and while the cost of this fuel for all their operations in 1852, when gold was chiefly refined and melted, was about \$7000, the cost of anthracite will be from \$600 to \$1000. In using the anthracite he found that a simple draught of air, without a blast, was quite sufficient to sustain combustion.

Californian gold frequently contains the alloy "iridosmine," which is not always detected by the assay. In order to remove it as far as possible without actually dissolving gold, it is allowed to subside, first in the granulating crucibles, and then in the crucibles for toughening (melting fine gold and copper). If the assayers report its presence in the toughened bars, they are again melted, and the iridosmine allowed to subside. By these three, and often four successive meltings, the gold is separated from its troublesome companion as far as practicable. The gold thus refined, and reduced to the proper standard [Section 8: "And be it further enacted, that the standard for both gold and silver coins for the United States shall hereafter be such that of 1000 parts by weight 900 shall be of pure metal and 100 of alloy; and the alloy of silver coins shall be of copper, and the alloy of gold coins shall be of copper and silver, provided that the silver do not exceed one-half of the whole alloy,"] is delivered over to the chief coiner in the form of bars or ingots of a certain weight, to be divided and shaped into pieces required for the currency of the country.

The Coining department of the establishment is of a power and efficiency sufficient to perform all the mechanical processes incidental to the issue of nearly 70,000,000 of pieces during the past year; and I was assured by Mr. Franklin Peale, the chief coiner, that it could have executed much more if it had been steadily employed, or fully supplied with material during the whole of that period. It is not necessary to go through the whole course of operations in this department, but to notice only such as possess novelty or present special characteristics.

The necessary power for working the machinery is obtained from a large steam-engine of the form usually known as the steeple-engine; it is a double vertical high-pressure engine, with cranks at right angles, the power being carried off by a caoutchoue belt, 2 feet wide, from a drum of 8 feet in diameter; the estimated power is equal to 90 horses. At times, this is all required, at others much less is sufficient, and in uncertain proportions; to meet this irregularity, and to insure that steadiness of motion so necessary in such delicate operations, a governor and throttle-valve of a peculiar construction have been devised which have now been in use for some time, and have produced most satisfactory results, fully effecting the purpose for which they were designed. The rolling mills, four in number, are driven by belts, at the rate of six revolutions per minute; the distances between the rollers being adjusted by double wedges, moved by a train of wheels which are connected with a dial-plate and bands, divided and numbered into hours and minutes, so as to indicate the proper thickness of the stripes of metal without the use of gauges. Gold stripes are heated in an iron heater by steam, and waxed with a cloth dipped in melted wax, and the silver strips are coated with tallow by means of a brush. The draw bench is used for both metals, and trial pieces are cut from every strip and their weight tested, preparatory to the cutting of the whole.

The cutting processes are very simple and efficient, consisting of a shaft moved by pulleys, and a $2\frac{1}{2}$ -inch belt, with a flywheel of small diameter but sufficient in momentum to drive the punch through the slip of metal by means of an eccentrie of $\frac{1}{2}$ -inch, at the rate of 250 pieces per minute, which skilled hands can readily accomplish and continue until the slip is exhausted. The annealing during the rolling of the ingots into slips is performed in copper cases, in muffles of fire-clay and brick, heated by anthracite coal, three muffles or hearths being kept at a bright red heat by one fire-grate or furnace, and the distribution and intensity regulated by dampers. These annealing furnaces are recent in their construction and very satisfactory in operation; they are heated by anthracite at the cost of about one-fourth the expense of the wood previously employed.

The whitening of planchets is performed as usually by inclosing the gold in luted boxes, and by exposing the silver in an open pan, to the heat of a simple furnace with wood fuel; the drying and sifting after the action of dilute sulphuric acid, is rapidly and effectually accomplished by a rolling screenone portion of which consisting of a pair of closed concentric cylinders, between which high-pressure steam is admitted. The blanks, with a sufficient quantity of light wood sawdust (linden or bass wood is the best), being introduced into the interior cylinder, a revolving motion is given to it by the engine for a certain time; the door is then opened and the blanks and sawdust gradually find their way into the wire screen by which they are separated, the movement being continued until the separation is complete, when the blanks are discharged at the end of the machine. An arrangement exists by which a slight inclination is given to the machine so as to direct the motion of the blanks towards the discharging end.

The milling machines are, I was informed, peculiar to this mint, and are in a great measure original, the operation being performed by a continuous rotary motion, with great rapidity