

CENTENNIAL EDITION.]

[TWENTY-FIVE CENTS.]

A BRIEF DESCRIPTION OF

THE MINT

OF THE

UNITED STATES.



PHILADELPHIA :

S. T. SOUDER & CO., PUBLISHERS, 721 SANSOM STREET.

1876.

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Jobbers and Retailers

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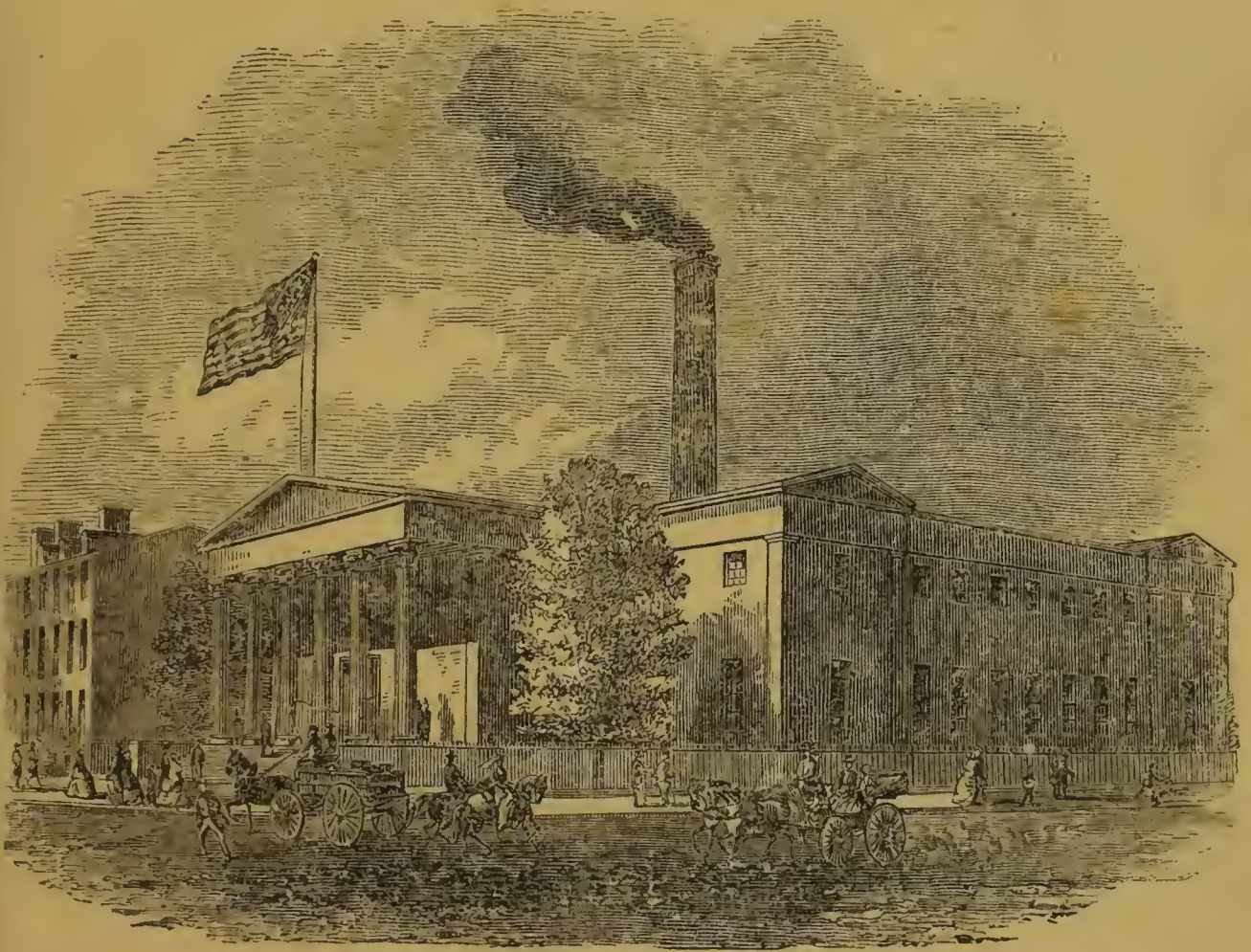
Above Broad St.

PHILADELPHIA.

Representants of the Silk Manufacturers of Lyons, France, and of Buchholz & Co., Lace Manufacturers, Brussels, at the International Exhibition, 1876.

T H E
UNITED STATES MINT.

A BRIEF HISTORY OF THE INSTITUTION, WITH A FULL
DESCRIPTION OF THE MANNER IN WHICH GOLD,
SILVER, NICKEL AND COPPER ARE
CONVERTED INTO MONEY.



VALUABLE TABLES OF FOREIGN COINS, WITH THEIR VALUE IN U.S. COIN, TO-
GETHER WITH OTHER INFORMATION IN REGARD TO THE
MINT, OF GENERAL INTEREST.

PHILADELPHIA:
S. T. SOUDER & CO., PUBLISHERS, 721 SANSON STREET.
1876.

OFFICERS
OF THE
MINT OF THE UNITED STATES,
PHILADELPHIA.
1876.

HON. JAMES POLLOCK, *Superintendent.*

PROF. JAS. C. BOOTH,
Melter and Refiner.

COL. A. LOUDEN SNOWDEN,
Chief Coiner.

N. B. BOYD,
Assistant Melter and Refiner.

O. C. BOSBYSELL,
Assistant Coiner.

WM. E. DUBOIS,
Assayer.

WM. BARBER,
Engraver.

JACOB B. ECKFELDT,
Assistant Assayer.

HENRY C. HICKOK,
Chief Clerk.

MARK H. COBB, *Cashier.*

THE U. S. MINT.

Early History of the Institution.

THE Mint was established by the act of Congress of the 2d of April, 1792. A building was soon after erected on the east side of Seventh street, above Market, for the use of the Mint. The first director was David Rittenhouse, LL.D., who was appointed by President Washington, April 14th, 1792. From that time until the present the following named gentlemen have occupied the director's chair:—

Henry William De Saussure	appointed July 8th, 1795.
Elias Boudinot	“ Oct. 28th, 1795.
Robert Patterson	“ Jan. 17th, 1806.
Samuel Moore.....	“ July 15th, 1824.
Robert M. Patterson.....	“ May 26th, 1835.
George N. Eckert.....	“ June 30th, 1851.
Thomas M. Pettit.....	“ April 4th, 1853.
James Ross Snowden.....	“ June 3d, 1853.
James Pollock.....	“ April 4th, 1861.
William Millward (not confirmed).....	“ Oct. 1st, 1866.
Henry R. Linderman.....	“ April 1st, 1867.
James Pollock (the present superintendent).....	“ May 1st, 1869.

Under an Act of Congress approved February 12th, 1873, Henry R. Linderman was appointed by the President to the charge of the Mint and all branch Mints and Assay Offices in the United States, with the title of *Director of the Mint*. The title of *Superintendent* being substituted for those appointed to the direction of the Mints at Philadelphia, San Francisco, etc.

The first money coined by the authority of the United States was in 1793. The coins first made were copper cents. In the following year (1794) silver dollars were made. Gold eagles were made in 1795. The machinery as well as the metal first used was imported, and great trouble was experienced in procuring a supply of copper. The first copper used by the Mint came from England.

Up to the year 1816 the work at the Mint was done entirely by hand or horse power. In this year steam was introduced. At different periods during the years 1797, 1798, 1799, and 1802-3, the Mint suspended operations on account of the prevalence of yellow fever in the city. Compared with the present, things were done in a rather primitive way in the earlier days of the institution. Among the accounts for 1792-3, there were bills for rum, cider, hay and pasture. We also find the following among the rules of a later day:—“It is understood that in future the workmen and laborers find themselves in diet, drink and lodgings.” Liquor was allowed in plentiful quantities, and we find it mentioned as a “fatigue ration.” Provision was also made for the care and feeding of watch-dogs. Of course all these “peculiarities” have long since ceased to be fostered or even countenanced.

The Present Building.

The corner-stone of the present building on the north side of Chestnut street, below Broad, was laid on the 4th day of July, 1829, by Samuel Moore, who was at that time director. The building was not ready to be occupied until May, 1833. The structure is of marble, and of the Grecian style of architecture; it was made fire-proof in 1854. Numerous alterations have been made in the interior since the erection of the building.

A Walk Through the Institution.

The hours for visiting the Mint are from 9 to 12 o'clock, A. M., and it is open every day, except Sundays or holidays. Polite and courteous ushers meet you at the door, and accompany you through those departments of the institution which are open to visitors. It is estimated that over thirty thousand people have visited the institution in the course of a single year. Owing to the immense amount of precious metal which is constantly in course of transition from one form to another, and the care and watchfulness necessary to a correct transaction of business, visitors are not permitted to visit some of the departments. These are of little interest to the unscientific, and are described under their proper heads. Everything is weighed so nicely and so often that the purloining of the slightest particle would be detected within a few moments after the act had been perpetrated.

Standing in the small rotunda at the entrance, and looking into the building, we have the office of the Treasurer of the Mint on our left; on the right is the Cashier's office. Passing through the hall leading to the yard we have the Treasurer's Clerks' room on the right. A part of this room is used by the Adams Express Company, who convey many thousands of dollars worth of metal, coin, etc., to and from the Mint.

The Deposit, or Weighing Room.

On the left is the Deposit, or Weighing Room. In this room all the precious metal used by the Mint is received and weighed. Deposits of plate, jewelry, or native gold of less than one hundred dollars in value will not be received. It is estimated that about six hundred million dollars worth of gold has been received and weighed in this room. Of this sum probably nine-tenths has been received since the first discovery of gold in California, in 1848. Previous to that time the gold came from different places, but principally from Virginia, North Carolina and Georgia. Considerable quantities, of a very fine quality, have come from Nova Scotia during the past four or five years. Most of the gold which reaches the Mint at the present time comes from Montana Territory. Nearly all west of that goes to the Branch Mint at San Francisco.

Before the discovery of the immense veins of silver which exist in the Territories of the United States, the silver used by the Mint came principally from Mexico and South America. The precious metals are now found in most of the Territories through which the Rocky and other mountains pass.

The copper used by the Mint comes principally from the mines of Lake Superior. The finest is found in Minnesota. The nickel is principally from Lancaster county, Pa., but it is also found in other sections of the country.

Looking into the Deposit Room from the yard are seen the scales used in weighing gold and silver. The largest weight used in the Mint is seen in

this room ; it is five hundred ounces. The smallest weight used in the Mint is found in the Assay Room ; it is the thirteen-hundredth part of a grain, and can scarcely be seen with the naked eye, unless on a white ground. The smallest weight used in the Deposit Room is the one-hundredth part of an ounce, or, what is more readily comprehended, the one-fifth of a pennyweight. The largest scale in this room will weigh from six thousand ounces to the one-hundredth of an ounce. The next size weighs as much as three thousand ounces at a draft. The smallest weighs as much as three hundred ounces at a draft. The reader can imagine the delicacy of these scales much better than they can be described. They are examined and adjusted alternate days, sometimes oftener. On the right hand side of the room is the vault. There are twelve of these vaults in the institution. They are of solid masonry. The most important of them are lined with iron, and have double iron doors, and most complicated locks.

In regard to the discovery of gold in California, the following extract from a letter from the Director of the Mint to the Secretary of the Treasury, dated December 11, 1848, will prove interesting. It reads as follows :—

“On the 8th instant we received the first deposit of gold from California. It was deposited by Mr. Daniel Carter, who brought it from San Francisco, by the Isthmus route. It weighed 1804.59 ounces troy. * * * On the 9th, another deposit was sent by the Secretary of War, which weighed 228 ounces. * * * The average value per ounce of the bullion before melting is \$18.05 $\frac{1}{3}$.”

The purest gold in this country has been found in the State of Georgia. It is seldom found in any great quantity in any of the Southern States. The largest nugget of gold ever brought to the Mint came from California in 1852, and was worth nearly six thousand dollars in gold. Attempts have been made to deposit spurious or manufactured nuggets at the Mint ; but no matter how nicely the fraud has been concealed, the cheat has always been detected before the “stuff” was melted. Gold, as received from the hands of the miner, in its native state, is often of curious formation, and differs considerably in outward appearance. It is found in fine dust, in grains from the size of a pin’s head to that of a pea, and in lumps varying in size from a pea to the size of a man’s hand. It is occasionally found in a crystalline form.

The Deposit Melting Room.

After the metal is weighed carefully in the deposit room, in the presence of the depositor and officers of the Mint, it is locked up in iron boxes, and conveyed to the melting room, where the boxes are unlocked by two men, each provided with a key. There are four furnaces in this room, and the first process of melting which the gold or silver goes through after falling into the hands of the Mint, takes place here. The metal, after being properly mixed with borax, or other fluxing material, is placed in pots and melted. It is then poured into iron moulds, and when cool is again carried to the deposit room and re-weighed, after which a small piece, weighing about three pennyweights, is cut off from each deposited lot by the Assayer. From this small piece the fineness of the whole lot (perhaps \$10,000 worth) is ascertained, its value calculated, and the depositor paid. The gold in its rough state is then ready to be transferred to the Melter and Refiner to be refined and rendered fit for coinage.

Office of the Melter and Refiner.

In the southwest corner of the building, and adjoining the Deposit Melting Room, is the office of the Melter and Refiner, and his assistants. This is the general business office of the head of this department, and is also used for weighing the necessary quantities of different metals used in alloying coin.

The Assay Rooms.

The small piece taken off each lot by the Assayer is conveyed up stairs to the Assay Rooms. These rooms are in the southwest corner of the building. In the back room are the fires, stills and other appliances necessary for the performance of all the work of the department. In the front room are the delicate scales referred to in the description of the Deposit Room. These scales or "balances" are inclosed in glass cases, and when the Assayer is engaged in weighing the gold they are kept closed, that the air may not reach them and thereby influence either side.

The Process of Assaying Gold.

The small piece of gold is placed in a black lead pot, and covered with borax, to assist the fluxing, and to prevent oxidation of the alloy. It is thus melted down and stirred, by which a complete mixture is effected, so that an assay piece may be taken from any part of the bar after it is cast. The piece taken for this purpose is rolled out for the convenience of cutting. It is then taken to an assay balance (sensible to the ten-thousandth of a half gramme or less), and from it is weighed a half gramme, which is the normal assay weight for gold, being about 7.7 grains troy. This weight is stamped 1000; and all the lesser weights (afterwards brought into requisition) are decimal divisions of this weight, down to one ten-thousandth part.

Silver is next weighed out for the quartation (alloying), and as the assay piece, if standard, should contain 900-thousandths of gold, there must be three times this weight, or 2700-thousandths of silver; and this is the quantity used. The lead used for the cupellation is kept prepared in thin sheets, cut into square pieces, which should each weigh about ten times as much as the gold under assay. The lead is now rolled into the form of a hollow cone; and into this are introduced the assay gold and the quartation silver, when the lead is closed around them and pressed into a ball. The furnace having been properly heated, and the cupels placed in it and brought to the same temperature, the leaden ball, with its contents, is put into a cupel (a small cup made of burned bones, capable of absorbing base metals), the furnace closed, and the operation allowed to proceed, until all agitation is ceased to be observed in the melted metal, and its surface has become bright. This is an indication that the whole of the base metals have been converted into oxides, and absorbed by the cupel.

The cupellation being thus finished, the metal is allowed to cool slowly, and the disc or button which it forms is taken from the cupel. The button is then flattened by a hammer; is annealed by bringing it to a red heat; is laminated by passing it between the rollers; is again annealed; and is rolled loosely into a spiral or coil called a *cornet*. It is now ready for the process of quartation. This was formerly effected in a glass matrass, and that mode is still used occasionally, when there are few assays. But a great

improvement has been recently introduced here, the *platinum apparatus* invented in London. Briefly, it consists of a platinum vessel in which to boil the nitric acid which is to dissolve out the silver, and a little basket, or tray containing a suite of thimbles with fine slits in the bottom, all of which vessels are also platinum. In these the silver is taken out by successive doses of acid without any decanting as in the case of glass vessels. The cornets are also annealed in the thimbles; in fact there is no shifting from the coiling to the final weighing, which determines the fineness of the original sample by proportional weights in thousandths. In this process, extra care has to be taken in adding the proportions of silver, as the "shaking" of any one cornet might damage the others.

The Silver Assay.

The silver is melted in a black lead pot, with the addition of fine charcoal within the pot, to prevent oxidation and to allow of dipping out. After stirring, a small portion of the fluid metal is poured quickly into water, producing a granulation, from small fragments of which the portion for assay is taken. As this differs from the mode pursued with gold, it must be specially noted that in the case of silver alloyed with copper there is a separation to a greater or less degree, between the two metals in the act of gradual solidification. Thus an ingot, or bar, cooled in a mould, or any single piece cut out of such ingot, though really 900-thousandths fine on the average, will show such variations, according to the place of cutting, as might even exceed the limits allowed by law. This fact has been established by many experiments both in this Mint and the Mint of Paris, France, since the enactment of our Mint law, and it possesses the stubbornness of a law of chemistry. But the sudden chill produced by throwing the liquid metal into water yields a granulation of entirely homogeneous mixture, and it can be proved that the same fineness results, whether by assaying a single granule, or part of one, or a number together. From this sample the weight of 1115 thousandths is taken; which is dissolved in a glass bottle, with nitric acid. Into this solution the large pipette-full of standard solution of salt is introduced, and it produces immediately a white precipitate, which is chloride of silver, and which contains of the metallic silver, 1000 parts. To make this chloride subside to the bottom of the vessel, and leave the liquid clear, it is necessary that it be violently shaken in the bottle; and this is accordingly done, by a mechanical arrangement, for the necessary time. Unless the pieces have chanced to be below the allowable limit of standard, the liquid will still contain silver in solution, and accordingly a portion of the decimal solution is introduced, from the small pipette, capable of precipitating a thousandth of silver, and a white cloud of chloride will show itself. More doses are added if the indications require it. The liquid is again shaken, and cleared, and the process is thus repeated, until the addition of the salt water shows only a faint trace of chloride below the upper surface of the liquid. Let us suppose, for the sake of an example, that three measures of the decimal solution have been used with effect. This will show that the 1115 parts of the piece contained 1003 of pure silver; and thus the proportion of pure silver in the whole alloyed metal is ascertained. The gold and silver used in the assaying process is returned to the depositor.

The Separating Room.

GOLD.

Occupying the greater part of the west side of the building (second floor) is the Separating Room. Here the gold and silver used by the Mint in the manufacture of coin and fine bars are separated from each other, or whatever other metals may be mixed with them, and purified. It goes to this room after having been once melted and assayed. In separating and purifying gold, it is always necessary to add to it a certain quantity of pure silver. The whole is then immersed in nitric acid, which dissolves the silver into a liquid which looks like pure water. The acid does not dissolve the gold, but leaves it pure. The silver solution is then drawn off, leaving the gold at the bottom of the tub. It is then gathered up into pans and washed.

SILVER.

The silver in the condition in which it is received from the hands of the depositor, and generally filled with numerous impurities, is melted and then granulated, after which the whole mass is dissolved with nitric acid. The acid dissolves the base metal, as well as the silver. The liquid metal is then run into tubs prepared for it, and precipitated, or rendered into a partially hard state, by being mixed with common salt water. After being precipitated it is called "chloride," and resembles very closely new slacked lime, or "smearcase." By putting spelter or zinc on the precipitated chloride, it becomes metallic silver, and only needs washing and melting to make the purest virgin metal. The base metals remain in a liquid state, and being of little value are generally thrown away. The process of refining silver is of two kinds; that of melting it with saltpetre, etc., which was known some thousands of years since, and the modern process of dissolving it in nitric acid, just like the method of extracting it from gold in the above described operation.

The Drying Cellar.

After the separating process has been completed, the gold or silver is conveyed to the Drying Cellar, where it is put under a pressure of some eighty tons, and all the water pressed out. It is then dried with heat, and afterwards conveyed in large cakes to the Melting Room.

The Gold and Silver Melting Rooms.

On the first floor, in the northwest corner of the building, are the gold and silver melting departments. The floor is divided in the centre by a partition. On the right is the silver department. Here all the silver used by the Mint in coining money, as well as the fine merchant bars, is mixed (alloyed), and melted. On the left is the gold department. Both gold and silver go through nearly the same process. The gold or silver, having passed through the separating and purifying process, is brought to these rooms, where it is properly mixed, heated, and then poured into an iron mould. When cool it is knocked out of the mould, and although it is rich-looking, it is without that brilliant lustre which we see in new coin. The piece taken from the mould is now called an ingot. It is about twelve inches long, and is wedge-shaped at one end. This end is made wedge-shaped to facilitate its passage through the rollers. A gold ingot is worth about \$1200 in gold. A silver ingot (dollar) is worth about \$60 in silver. Silver, gold, etc., ingots differ

in value and size, according to the denomination of the coin to be cut from them. The fine (pure) gold and silver bars, used for commercial purposes, instead of coin, and also by gold and silver platers, are also made in this room. They are stamped with their weight in ounces, and their value in money in the deposit room. A noticeable feature about these rooms is the false floor. It is of iron, and is laid in small sections. It acts as a continual "scraper," and prevents any of the small particles of precious metals from sticking to the shoes of those who pass through the rooms. The sweepings of these rooms have sometimes proved to be worth \$50,000 in one year.

The Copper Melting Room.

On the same side, and in front of the Gold and Silver Melting Rooms, is the room wherein all the base metals used in coinage are melted and mixed. Up to the year 1857, the base coin of the United States was exclusively copper. In this year the coinage of what was called the nickel cents was commenced. These pieces, although called nickel, were composed of one-eighth nickel; the balance was copper. Since the first coinage of nickel money, the pieces have changed two or three times, both in design and mixture. The present coinage of base coins is as follows:—

NICKEL.

	<i>Weight.</i>	
Three Cent.....	32 gr.....	180 pieces to the pound.
Five Cent.....	77 16-100.....	or about 74 pieces to the pound.

BRONZE.

	<i>Weight.</i>	
One Cent.....	48 gr.....	120 pieces to the pound.
Two Cent.....	96 gr.....	60 pieces to the pound.

The composition of the five and three cent pieces is one-fourth nickel; the balance copper. The bronze pieces are a mixture of copper, zinc and tin, about equal parts of each of the two last; the former contributing about 95 per cent. There are seven furnaces in this room, each capable of melting five hundred pounds of metal per day. When the metal is heated and sufficiently mixed, it is poured into iron moulds, and when cool, and the rough ends clipped off, is ready to be conveyed to the rolling room.

The Rolling Room.

On passing from the gold-melting room through the corridor leading to the rolling room, the first object of interest which meets the attention is an upright engine on the right. This engine is eighty horse power, and supplies the motive power to the rolling machines. On the left are the "rollers." About two hundred ingots are run through per hour on each pair of rollers. Gold, silver and base metal ingots are all put through the same process of rolling. They are received from the melting rooms in the same shape and size, and are passed through the rollers until they assume the shape of long thin strips of the requisite thickness for the sort of coin required. Just back of the "rolls" are a number of machines used for cutting, trimming and flattening the strips. In the rear of these machines are, ranged in a row, in the extreme back part of the room, the Cutting Presses. There are nine of these machines, each one capable of cutting two hundred and twenty-five pieces (planchets) per minute. If these planchets are of the denomination of cents, but \$2.25 per minute is made, but if, on the

contrary, the planchets are gold, and of the denomination of double eagles, we have the sum of \$4,500 per minute. These presses are a comparatively recent invention, and each press is capable of cutting any denomination of coin, as they are regulated by the size of the punch, which is movable. A sample of planchets from each strip is carefully weighed before the strip is permitted to be used. The planchets, as cut, fall into boxes beneath the press, and are taken out in quantities and annealed in the furnaces. On the extreme left, on a line with the cutting presses, are the Draw Benches. These machines are used for regulating accurately the thickness of the strips of gold or silver, and smoothing off any lumps or other unevenness by drawing the strips between stationary rollers previously set to the required thickness. The machinery of this end of the room is run by an engine in the cellar beneath.

The Annealing Furnaces.

On the right, looking towards the rear of the room, will be seen a number of furnaces. These are the annealing furnaces. The metal, after passing through the "rolls," becomes very brittle and hard, from being worked, and it is necessary to soften it before putting it through any further process. It is therefore heated to a red heat, and when it becomes soft and pliable, is taken out and allowed to cool. The base metal strips are laid loosely in the furnace, but more care is exercised with the precious metals. They are placed in copper canisters, and carefully guarded from any friction that might cause them to lose the slightest particle, and to prevent oxidation.

The Adjusting Room.

The planchets, if gold or silver, are conveyed from the annealing furnaces to the Adjusting Room, immediately overhead. The work of this room is of the most delicate description, and is executed entirely by ladies. Here the planchets are inspected and weighed, on very fine scales. There is a certain deviation in the weight of all coins allowed by law. If a planchet is found too light, it is thrown aside and melted over again; if too heavy, but very near the weight, it is taken in hand, and a small particle filed off the edges; if too heavy to admit of filing, it is thrown aside with the light ones and melted again into ingots. If the planchet is found to be of the proper weight, it is then ready for the cleaning room. The base coins (nickel, etc.) are not taken to this room.

The Cleaning Room.

After the planchets have passed through the Adjusting Room and the milling process, those that are found to be of the proper weight, etc., are taken to the northeastern corner of the building, in the rear of the annealing furnaces, where they are cleaned with heat and acid, and are then washed in water, and thoroughly dried. They are now ready for

The Coining Room.

Occupying a greater portion of the first floor, on the east side of the building, is the Coining Room. This is probably the most interesting department to the casual visitor of any in the Mint. On entering the door is seen the engine, one of the finest pieces of workmanship in the country. It

is almost entirely noiseless, and of twenty-horse power. The dial which is attached to the engine, and stands directly in front of the visitor, marks the number of revolutions, and enables the Chief Coiner to tell whether the machinery has been stopped at any time without good cause. A greater part of the fine work of the engine was made and put up by the workmen of the Mint in 1839, and it operates all the machinery in this room.

THE MILLING MACHINES.

On the left, looking towards the engine, are the Milling Machines. These little machines are operated by ladies, and are used to turn up the edges of the planchets, before they are ready for the coining press. Each machine is capable of finishing from five to twelve hundred pieces per minute.

THE COINING PRESSES.

Turning to the right, the massive yet delicate Coining Presses stand before you, scrupulously clean and finely burnished. There are ten of these presses, each one capable of making from *seventy to one hundred and twenty* coins per minute. They are seldom run at a greater speed than eighty per minute. If each press in the room was run at its greatest capacity, and engaged in making double eagles (\$20), in the short space of one minute we should have the astonishing sum of \$34,000 manufactured. Only the largest presses are used in making coins of large denomination. The small presses are used for base coins and the smaller denominations of silver pieces. The amount of pressure necessary to making a perfect coin is from twenty to eighty tons. The larger the piece the more pressure is required. These machines are attended by ladies, and do their work in the most perfect manner. The deviation of a hair's breadth would spoil the coin.

BRIEF DESCRIPTION OF THE MODE OF STAMPING COINS.

The impressions on both sides of the coin are made with one motion of the press. A steel die, whereon the characters to be placed on the coin have been engraved or dug out, is fastened, by means of screws, on to what is called a "stake," and placed below or on the bed of the press. It is set about the thickness of the coin below the surface, and is surrounded by a "collar." It makes no material difference whether the obverse or reverse of the coin is below, although the latter is generally placed there. On a portion of the machine made to receive it, working directly over the lower die, the obverse die is fixed, and on this portion the pressure is regulated.

The process by which the coins are made is very similar in all denominations, with the exception spoken of below. The planchets are placed by hand in a brass tube, and at each revolution of the press two iron arms, called "feeders," working like a pair of tongs, slide rapidly out, grasp a planchet from the bottom of the tube, and put it on the lower die. Almost at the same moment the lower die sinks below the "collar," the upper one descends, the planchet is pressed between them both, receives the impression, and in a twinkling this one is caught by the "feeders," is thrown into a box beneath the press, another planchet takes its place, and so on throughout. After the planchet passes through this process, it is *coin*, and not till then, according to authority. It is noticeable that the base coins have smooth edges, while gold and silver have "reeded" or nicked edges. The difference in the edges is caused by the "collars" in which the planchets are pressed; those for

the gold and silver coins are delicately nicked, while those for the base coins are perfectly smooth.

STATEMENT OF ALLOY AND LEGAL DEVIATIONS.

The subjoined statement exhibits the proportion of precious metals and alloy in our gold and silver coins, together with the weights of the several denominations of the same allowed by law; also a statement of the base metals composing our minor or token coinage, with the weights of the several pieces, and lawful deviation from the same:—

	Weight of Single Pieces.	FINENESS.	PROPORTIONATE ALLOY.	Deviation in Weight allowed by Law.
	<i>Grains.</i>			<i>Grains.</i>
GOLD—				
Double Eagles.....	516	900	900 parts gold, 100 parts copper	1/2
Eagles.....	258	900	900 Do. 100 do.	1/2
Half Eagles.....	129	900	900 Do. 100 do.	1/2
Three Dollars.....	77.4	900	900 Do. 100 do.	1/4
Quarter Eagles.....	64.5	900	900 Do. 100 do.	1/4
Dollars.....	25.8	900	900 Do. 100 do.	1/4
SILVER—				
Trade Dollars.....	420	900	900 parts silver, 100 parts copper	1 1/2
Half Dollars.....	192	900	900 Do. 100 do.	1 1/2
Quarter Dollars.....	96.45	900	900 Do. 100 do.	1 1/2
Twenty Cents.....	77.16	900	900 Do. 100 do.	1 1/2
Dimes.....	38.58	900	900 Do. 100 do.	1 1/2
NICKEL—				
Five Cent.....	77.16		25 parts nickel, 75 parts copper	2
Three Cent.....	32		25 Do. 75 do.	4
BRONZE—				
One Cent.....	48		95 parts copper, 5 tin and zinc.	4

Note.—480 grains = 1 Troy ounce.

THE COUNTING BOARDS.

The Counting Boards are a most simple and yet ingenious invention, and are used for counting the small silver and base coins into packages varying in value from five to fifty dollars. By this process twenty-five dollars in five-cent pieces can be counted in less than a minute. The "boards" are a simple flat surface of wood, with copper partitions, the height and size of the coin to be counted, rising from the surface at regular intervals, and running parallel with each other, from top to bottom. They somewhat resemble a common household "washing board," with the grooves running parallel with the sides, but much larger. The boards are worked by hand, over a box, and as the pieces are counted they slide into a drawer prepared to receive them. They are then put into bags and are ready for shipment.

Chief Coiner's Office.

The gold and silver coins, after leaving the coining room, are transferred to the Chief Coiner's business office, or counting room, where they are again weighed and counted, and then put up in packages. From this office they are transferred to the Treasurer, and are ready for delivery.

The Cabinet.

Passing to the second story of the building the visitor registers his name and residence in a book provided for the purpose, and then passes on to the Cabinet. Here much will be found of general interest. Portraits of the different gentlemen who have acted as Directors of the institution at different times grace the walls, while around and about the room, arranged in cases, are collections of medals and coins. Each medal has an inte-

resting history attached to it, as commemorating some important event in the annals of this and other nations. Specimen coins of all the nations in the world will here be found. Among others are those of ancient Rome, A. D. 177 to 222; the Greek Republic, 300 to 700 B. C.; together with a collection of Oriental, Chinese and Japanese. Passing on round the room a plaster cast of Oliver Cromwell is seen, which is said to be a good likeness. A machine for assorting coins attracts considerable attention on account of the delicacy of workmanship. It is not in use. A large and most elegant collection of agates, petrified wood, together with specimens of gold in its native state, will be found here. At the opposite end of the room, among a collection of odd and rare coins, will be seen the "widow's mite," the smallest of all ancient coins, and which is mentioned in the New Testament. A collection of Washington Medals, one hundred and thirty-eight in number, is seen at this end of the room. Here are also seen the scales by which the weights for the Mint are regulated and adjusted. This department is provided with a number of gentlemen, who will be pleased to impart such information in regard to the coins, medals, etc., as the visitor may desire. It is a most interesting department of the Mint, and the visitor will find much in it that is instructive and entertaining.

The Director's Room, Etc.

Just outside of the exit door of the cabinet is seen, in a glass case, a fine specimen of the American eagle, stuffed, with outstretched wings, as though in the act of flying. A *fac-simile* of this bird will be found upon the obverse of the first nickel cents that were coined.

To the right, looking down the stairs, is the Director's Room. Here this officer receives his visitors and transacts the business of his office. The next door, on the same side, is the Chief Clerk's room. Opening from this room is the office of the Chief Engraver. The transferring lathe, a most interesting piece of machinery, is found here. Further on is the private office of the Chief Coiner. This room has a fine library of scientific and historical works. On the left is the Messenger's room, back of which are the medal and other departments for the transaction of business.

Engraving and Machinists' Rooms.

Passing the Chief Coiner's room, and thence out upon the gallery, which runs completely around the building, the machine shop is reached. This department is stocked with lathes and all the necessary tools for doing the light work of the establishment. Back of this, and adjoining it, are the engravers' apartments. Here the dies used by the Mint are engraved. The dies for all the different Branch Mints are made here.

The Cellar, Etc.

Passing into the cellar of the institution, numerous vaults, used for different purposes, are seen fronting the corridor on Chestnut street. Passing into the main cellar, in a space immediately beneath the yard, are seen the six large boilers which generate the steam for the different engines, and heat portions of the building. Each one of these boilers is of about thirty horse power.

On the right are the blacksmith, carpenter and paint shops. In the rear of this is the medal striking department. The process of striking a medal

differs from that of coin. They are struck with a screw-press, worked by hand.

"The Sweeps."

On the west side of the cellar is the "Sweep Grinding Room." Into this room all the dirt and sweepings of the Mint are conveyed and ground up into fine powder, and after the best has been selected it is taken to the melting room and all the metal extracted. The residue is sold.

The Wells.

In this vicinity are also the wells, wherein all the water used in washing out the different rooms, as well as that which comes from the different portions of the building in time of rain, is received and filtered. They are cleaned out every few years, and the dirt is disposed of as in the case of the "sweepings." Of late years the sweepings, etc., have been of comparatively little value.

The Cent Room.

A small wooden building, in the centre of the yard, and immediately above the boilers, is called the Cent Room. In this room the bronze cents are exchanged for the nickels, etc. Although insignificant in appearance this little place has played a prominent part in the financial history of the country.

General Remarks.

No eagles were coined from 1805 to 1837 inclusive; no half eagles in 1816 or '17; no quarter eagles before 1795, nor in 1800 or '01, nor from 1809 to 1820, or in '22, '23, '28 or '41; no dollars from 1806 to 1838 except 1000 in 1836; no half dollars from 1797 to 1800, nor in 1815; no quarters before 1796, none from 1798 to 1803, none from 1803 to 1814, and none in 1817, '24, '26, '29 and '30; no dimes before 1795, none in 1799, 1806, '08, '12, '13 '15 to '19, none in '24, '28 and '30; no half dimes in 1798, '99, 1804, '06, to '28; no cents in 1815; a few specimens in '23; no half-cents in 1798, 1801, 1812 to '24, '27 to '30, '34, '36, and '40. A few half-cents were struck every year from 1840 to '57. First three dollar pieces in 1854.

The coinage of the Silver Dollar of 412½ grains, the Five and Three Cent Silver pieces, and Bronze Two Cent piece, was discontinued under the Coinage Act of 1873, which went into effect on the 1st of April of that year.

Pure silver is worth \$1.30 an ounce, troy. Pure gold is worth \$20.67 an ounce, or a fraction over fifteen times as much as silver. The pure gold is always a bright straw color; the different grades of color seen in jewelry, etc., are caused by different alloyage.

Half Cents have not been coined since 1857. *All* of the base coins for the country are coined in this institution. It is capable of making enough coin to supply the wants of all the nations of the world.

The coinage of the Mint up to June 30th, 1875, amounted to \$1,074,660,575.95. This includes gold, silver, nickel, and copper. The Mints at Carson and San Francisco coin gold and silver only. The Mint at Denver does not make coin; its operations are confined to assaying and refining.

Coin is procured from the Mint in the following manner:—Any responsible person can make a deposit of gold or silver at the Mint, providing it be of one hundred dollars in value. On depositing the bullion the depositor is

furnished with a receipt for the gross weight of his deposit. After the fineness of the bullion has been ascertained by assaying, the calculations are made, and the depositor is paid the full value, deducting a small charge only for the work. If the deposit be gold, it is paid in gold; if silver, it is paid in silver. The Mint does not exchange money, and recognizes no depositor but the person who presents the bullion. In all cases the depositor is expected to state what State or country the bullion is from.

STATEMENT OF FOREIGN COINS.

WITH THEIR VALUE IN UNITED STATES COIN.

The following tables of the coins of different nations, together with their weight, fineness and value in United States coin, as recognized at the Mint, will be found of value to the general reader and the business public:

GOLD COINS.

COUNTRY.	DENOMINATIONS.	WEIGHT.	FINENESS.	Value in U. S. money.	
		Ounces.	Thousands.	\$	cts. m.
AUSTRIA.....	Fourfold ducat.....	0. 448	986	9	13 1
Do	Souverain, (no longer coined).	0. 363	900	6	75 4
Do	4 florins, (new).....	0. 104	900	1	93 5
Do	Ducat	0. 1119	985. 5	2	27 9
BELGIUM.....	25 francs	0. 254	899	4	72 0
BRAZIL.....	29 milreis.....	0. 575	916. 5	10	89 3
CENTRAL AMERICA.....	2 escudos	0. 209	853. 5	3	68 7
Do	4 reals.....	0. 027	875	0	48 7
CHILI.....	10 pesos, (dollars).....	0. 491	898	9	11 4
COLOMBIA and SOUTH AMERICA generally.....	Old doubloon *	0. 867	870	15	59 2
COLOMBIA.....	20 pesos, "Bogota"	1. 033	887	18	94 0
Do	20 pesos, "Medellin".....	1. 034	891. 5	19	05 5
Do	20 pesos, "Popayan".....	1. 029	891. 5	18	89 2
COSTA RICA.....	10 pesos.....	0. 476	858. 5	8	44 7
DE MARK	20 crown	0. 288	900	5	35 8
Do	Old ten-thaler.....	0. 427	895	7	89 8
EGYPT.....	Beddlik, (100 piasters).....	0. 275	875	4	97 3
ENGLAND.....	Pound, or sovereign, (new)...	0. 2568	916. 5	4	86 5
Do	Pound, average, (worn).....	0. 2563	916. 5	4	85 4
FRANCE.....	20 franc	0. 207	899	3	84 5
GERMAN EMPIRE.....	New 20 marks.....	0. 256	900	4	76 3
Do	Old ten thaler, (Prussian)....	0. 427	903	7	91 0
GREECE	29 drachms.....	0. 185	900	3	44 2
INDIA, (British).....	Mohur, or 15 rupees †	0. 375	916. 5	7	10 3
ITALY.....	20 lire.....	0. 207	899	3	84 5
JAPAN.....	20 yen.....	1. 072	900	19	94 2
MEXICO	Doubloon	0. 86735	870. 25	15	60 0
Do	20 pesos, (empire)	1. 086	875	19	64 2
Do	20 pesos, (republic, new).....	1. 084	873	19	56 1
NETHERLANDS	10 gilders.....	0. 215	899	3	99 3
NEW GRANADA.....	10 pesos, (dollars).....	0. 525	891. 5	9	67 4
NORWAY	20 crowns	0. 288	900	5	35 8
PERU	20 soles.....	1. 0357	898. 75	19	23 7
PORTUGAL.....	Coroa, (crown).....	0. 308	912	5	80 5
RUSSIA	5 rubles.....	0. 210	916	3	97 5
SPAIN.....	100 reals	0. 268	896. 5	4	96 3
Do	80 reals.....	0. 215	869	3	86 2
Do	10 escudos	0. 27045	897	5	01 4
SWEDEN.....	Ducat	0. 111	975	2	23 6
Do	Carolin, (10 francs).....	0. 104	900	1	93 4
Do	New 20 crowns, (krone).....	0. 288	900	5	35 8
TUNIS	25 piasters.....	0. 161	900	2	99 5
TURKEY.....	100 piasters.....	0. 231	915	4	36 8

* The *doubloon* (doblón, or more properly *onza*, though not really an ounce Spanish) is now generally discontinued, and is seldom seen here. These figures answer as well for the doubloon of Peru, Chili, Bolivia, etc., and therefore this item stands for all. Popayan pieces were rather inferior.

† The sovereigns coined at Melbourne and Sydney, in Australia, and distinguished only by the mint-marks M and S, are the same as those of the London mint. Sovereigns generally are up to the legal fineness, 916 $\frac{2}{3}$ (or 22 carats), but we report to the half in all cases.

‡ The last coinage of *mohurs* was in 1862.

SILVER COINS.

[For silver there is no fixed legal valuation; it is regulated by supply and demand. The present price is 1.17 cents per standard troy ounce. Standard silver is nine-tenths pure.]

COUNTRY.	DENOMINATIONS.	WEIGHT.	FINENESS.	Value in	
				U. S. money.	
		Ounces.	Thousands.	\$	cts. m.
AUSTRIA	Old rix-dollar	0.902	833	0	95 4
Do	Old scudo crown	0.836	902	0	95 7
Do	Florin, before 1858	0.451	833	0	47 7
Do	New florin	0.397	900	0	45 3
Do	New Union dollar	0.596	900	0	68 1
Do	Maria Theresa dollar, 1780	0.895	838	0	95 2
BELGIUM	5 francs	0.803	897	0	91 5
Do	2 francs	0.320	835	0	33 9
BOLIVIA	New dollar	0.801	900	0	91 5
BRAZIL	Double milreis	0.8187	917.75	0	95 4
CANADA	20 cents	0.150	925	0	17 6
Do	25 cents	0.1875	925	0	22 0
CENTRAL AMERICA	Dollar	0.866	850	0	93 5
CHILI	Old dollar	0.864	908	0	99 6
Do	New dollar	0.801	900.5	0	91 6
CHINA	Dollar, (English mint)	0.866	901	0	99 1
Do	10 cents	0.087	901	0	09 9
DENMARK	2 rigsdaler	0.927	877	1	03 2
EGYPT	Piaster, (new)	0.040	755	0	03 8
ENGLAND	Shilling, (new)	0.1825	924.5	0	21 4
Do	Shilling, (average)	0.178	925	0	20 9
Do	Florin	0.365	925	0	42 9
FRANCE	5 franc	0.8018	900	0	91 6
Do	2 franc	0.320	835	0	33 9
NORTH GERMAN STATES	Thaler, before 1857	0.712	750	0	67 8
Do	Thaler, (new)	0.595	900	0	68 0
SOUTH GERMAN STATES	Florin	0.340	900	0	38 9
GERMAN EMPIRE	5 marks, (new)	0.804	900	0	91 9
GREECE	5 drachms	0.719	900	0	82 2
HINDOSTAN	Rupee	0.374	916.5	0	43 4
ITALY	5 lire	0.802	900	0	91 7
Do	Lira	0.160	835	0	16 9
JAPAN	1 yen	0.8667	900	0	99 1
Do	50 sen	0.402	800	0	40 8
MEXICO	Dollar	0.870	903	0	99 8
Do	Half-dollar	0.435	898.5	0	49 6
Do	Pesto of Maximilian	0.861	902.5	0	98 7
NETHERLANDS	2 1/2 gilders	0.804	944	0	96 4
NORWAY	Specie daler	0.927	877	1	03 2
NEW GRANADA	Dollar of 1857	0.803	856	0	91 1
PERU	Old dollar	0.866	901	0	99 0
Do	Dollar of 1858	0.766	900	0	87 5
Do	Half-dollar of 1835-'38	0.433	650	0	35 7
Do	Sol	0.802	900	0	91 6
PORTUGAL	500 reis	0.400	912	0	46 3
ROUMANIA	2 lei, (francs), new	0.322	835	0	34 1
RUSSIA	Ruble	0.667	875	0	74 1
SPAIN	5 pesetas, (dollars)	0.800	900	0	91 4
Do	Peseta, (pistareen)	0.160	835	0	16 9
SWEDEN	Riksdaler	0.273	750	0	26 0
SWITZERLAND	2 francs	0.320	835	0	33 9
TUNIS	5 piasters	0.511	898.5	0	58 3
TURKEY	20 piasters	0.770	830	0	81 1

OTHER MINTS OF THE UNITED STATES.

An act of Congress, passed in 1873, authorized and established Mints at San Francisco, Cal., Carson City, Nevada, and Denver, Colorado. Also, assay offices at New York, Boise City, Idaho, and Charlotte, N. C.

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