

= Castaing machine =

The Castaing machine is a device used to add lettering and decoration to the edge of a coin . Such lettering was necessitated by counterfeiting and edge clipping , which was a common problem resulting from the uneven and irregular hammered coinage . When Aubin Olivier introduced milled coinage to France , he also developed a method of marking the edges with lettering which would make it possible to detect if metal had been shaved from the edge . This method involved using a collar , into which the metal flowed from the pressure of the press . This technique was slower and more costly than later methods . France abandoned milled coinage in favour of hammering in 1585 .

England experimented briefly with milled coinage , but it wasn 't until Peter Blondeau brought his method of minting coins there in the mid @-@ seventeenth century that such coinage began in earnest in that country . Blondeau also invented a different method of marking the edge , which was , according to him , faster and less costly than the method pioneered by Olivier . Though Blondeau 's exact method was secretive , numismatists have asserted that it likely resembled the later device invented by Jean Castaing . Castaing 's machine marked the edges by means of two steel rulers , which , when a coinage blank was forced between them , imprinted legends or designs on its edge . Castaing 's device found favour in France , and it was eventually adopted in other nations , including Britain and the United States , but it was eventually phased out by mechanised minting techniques .

= = Background = =

Prior to the introduction of milled coinage , hammered coinage , which resulted in a relatively crude product of irregular shape and size , predominated in European mints . In c . 1550 , an Augsburg goldsmith named Max Schwab created a new technique for striking coins , which included the use of rolling mills , presses to cut the coinage blanks and the coinage press . After learning about the invention via the French ambassador , King Henry II dispatched the Comptroller of Finance Guillaume de Marillac and François Guilhem , Master of the Mint in Lyon , to observe the machinery . Schwab 's press was turned with a weighted wooden handle , which exerted even pressure across the coinage blank , creating a sharper and more precise strike than hammering . De Marillac requested that Anne de Montmorency send him an engineer capable of creating a similar machine ; he sent the engineer Aubin Olivier . Olivier viewed the machine , and introduced his own version to France , to which he later added a segmented collar . This allowed for the expanding metal to fill the collar , creating reeding , designs or edge lettering at the same time as the obverse and reverse images were struck onto the coin . The segments of the collar were then removed , and the coin ejected . Such lettering was used to aid in detecting coins which were debased by clipping metal from their edges , a problem frequently encountered in hammered coinage . Olivier 's method of striking coins was considered costly relative to the previously utilised method , as the upper coinage die often came into contact with the collar on its downward descent , causing expensive damage . Milled coinage was thus abandoned in 1585 in favour of hammering .

Eloy Mestrelle introduced milled coinage to England in 1561 , but their production ceased in 1575 . On 8 August 1649 , the Council of State and the House of Commons opted to summon Peter Blondeau , a Paris Mint engineer , to London to modernise operations at the Tower Mint . Mint officials opposed Blondeau 's techniques , and subjected him to a series of trials in which the quality of his product would be compared to that made by the Mint . According to a pamphlet published in Blondeau 's name , his process is described as " a new invention , to make a handsome coyne ... that shall not only be stamped flat on both sides , but shall even be marked with letters on the thickness of the brim , " which was intended to prevent clipping . Blondeau described , in a proposition presumably meant for the Committee of the Mint , " two different ways to make the pieces marked about the thickness or edge . One is auncient , knowne to severall men , and according whereunto David Ramage [ the man whom the Mint had selected to create hammered coinage in competition to Blondeau 's ] , workeman of the Mint , hath made some bigg pieces ; but that way is very tedious , requireth much time , spoyles abundance of stamps and engines , and

cannot be done upon the currant money , which is thynne . " Blondeau was referring to the type of collar added to the Paris Mint 's early coinage presses by Olivier , which were time @-@ consuming to use and caused significant damage to coinage dies and engines . He went on to say " [ a ] s touching the new way , which is ready and expeditious , and can be based upon the thynne and currant money , I am the inventor of it , and only I know itt , as I can make appeare by experiences , if it be the pleasure of the State to imploy me . " Blondeau also argued that his methods would prevent counterfeiting , because the machinery required was too complex to be duplicated by criminals .

Following his swearing in as Lord Protector in 1653 , Oliver Cromwell became a proponent of Blondeau 's coinage method , which had yet to find favour in the nation 's minting establishment . In 1654 , Cromwell 's government placed Blondeau in charge of a planned mint in Ireland , where the coinage was heavily debased by fraudulent means . The proposed mint never came into existence , but in 1656 , Blondeau was given official appointment to strike £ 2 @, @ 000 worth of coins bearing Cromwell 's portrait with captured Spanish silver . The former Royal Mint superintendent , William John Hocking , believed that the edge lettering on Blondeau 's coinage was created by means of a perforated steel strip , through which the coin 's metal flowed during striking , creating the raised designs and wording . Hocking suggested that this technique would have been less costly than the older method involving the split collar , because the steel strip could be replaced more economically . However , the numismatist Peter B. Gaspar determined that Blondeau 's Cromwell @-@ era coinage was struck without a collar , which suggests that he used a machine to impart the edge lettering prior to striking .

Blondeau returned to France following Cromwell 's death , but he was summoned to return to London in 1661 following an order from King Charles II to modernise operations at the Mint . He received a contract from the Mint , which he fulfilled until his death in 1672 , to work as an engineer for tools , to instruct moneyers , and to conduct his edge lettering process . In his diary , the Member of Parliament Samuel Pepys remarked upon the secrecy maintained by Blondeau regarding this process , stating that coiners at the Mint " mark the letters on the edges , which is kept as the great secret by Blondeau . "

= = Invention = =

Though production of hammered coinage ceased in France in 1645 , edge lettering wasn 't immediately reintroduced to that nation 's milled coinage . At some point prior to 1679 , Jean Castaing , a French engineer , invented a machine to apply edge lettering to coins , and in 1685 , he approached the French government with a proposal to use his machine in that nation 's mints . King Louis XIV favoured the invention , but his financial minister , Jean @-@ Baptiste Colbert , believed that it would not be economically viable to pay the expenses required to put it into use . In 1686 , over Colbert 's objection , the French Council of State entered a contract with Castaing wherein all of the nation 's gold and silver coinage would include edge lettering created by his machine .

Two years later , in 1688 , in response to counterfeiting and to raise money to support the Nine Years ' War , Castaing proposed a method of reshaping and restriking existing coins , which was ultimately accepted . Castaing 's edge lettering machine was used on the overstruck coins , and the Royal Mint supervisor Martin Masselin , the individual who undertook the process , was obligated to pay Castaing for its use . In 1691 , Masselin was dismissed , as he and his clerks were found to have stolen from the Mint during the reformation of the coinage , and Castaing was appointed to perform the edge lettering and restriking in his place . A second reform took place in 1693 . Castaing was imprisoned in 1700 on charges of using inaccurate scales to weigh the coins to be reminted ; according to his wife , Marie Hippolyte Castaing ( née Bosch ) , the allegations were false , originating from opponents who lost money as a result of his machine 's introduction to the French Mint and the resulting monetary reforms .

According to the engineer and numismatist George E. Ewing , Jr . , Castaing 's machine was likely similar to that used by Blondeau in England , but " Castaing 's improvements made his machine worthy of being called an invention . "

## == Operation ==

An 1819 account described the operation of Castaing 's machine :

The machine used for this purpose consists of two plates of steel in form of rulers , on which the edging is engraved , half on the one , and half on the other . One of these plates is immovable , being strongly bound with screws to a copper plate on a board or table ; the other is movable , and slides on the copper plate by means of a handle , and a wheel , or pinion , of iron , the teeth of which catch in other teeth , on the surface of the sliding plate . The planchet , being placed horizontally between these two plates , is carried along by the motion of the movable one ; so as by the time that it had made half a turn , it is found marked all round .

According to a 1765 Encyclopédie entry , Castaing 's machine was capable of applying the edge lettering to 20 @, @ 000 coins daily .

The machine came into use at various mints throughout the world as a way to improve upon the existing machinery used for edge lettering . A copy of Castaing 's machine was put into use at the British Royal Mint , and in 1792 , the director of the newly established United States Mint in Philadelphia , David Rittenhouse , ordered three coinage presses from England to which he added a modified version of the machine . This became obsolete following Franklin Peale 's introduction of steam @-@ powered equipment to the Mint in 1836 . Castaing 's machine was replaced at the Paris Mint in 1803 , when one of the Mint 's engineers , Philippe Gengembre , created his own version .