In The Groove – Security Edges and Contemporary Counterfeiting in British West Africa and Nigeria

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Introduction

The official coinage of British West Africa has been well documented[(1)] and catalogued[(1,2)]. The book by David Vice is highly recommended for the full background story of what is briefly presented here[(1)]. This note focusses on the prevalence of contemporary counterfeiting in British West Africa of the silver, tin-brass, and nickel-brass coins and the later white metal counterfeits of the cupro-nickel coins of the British Protectorate of Nigeria.

A response to the counterfeiting was the introduction of an incuse security edge groove, developed by the Royal Mint in the 1930s. A detailed description of the process of creating the security edge has been found and is concise enough to be presented in full.[(3)] Whilst the extra process added to the cost of manufacture, it did little to reduce counterfeiting for reasons that will be discussed.

Though the story applies equally to the sixpences, shillings and florins, the various coins and counterfeits are illustrated with shillings from the author's collection.

British West African Currency and Contemporary Counterfeiting Prior to 1936

Prior to the formation of the West African Currency Board in 1912 the currency in this vast area comprised silver and base metal coins imported from Britain. The silver coins were standard British coins and the smaller denominations struck with specific designs for the area. Large quantities of coin from other historical occupying countries also circulated widely. Other transactions were carried out using Native money ranging from cowries, brass manillas, gold dust, iron bars to bottles and crates of gin.[(1)]

The first silver coins ordered by the Currency Board arrived in 1913 and followed the British denominations, weights and metal standard. During the war years the silver coinage was subcontracted to the Heaton Mint in Birmingham. The West African economy worked very differently to that in Britain. The first was dominated by agriculture and some mercantile trade and the second dominated by industry, businesses and merchants. It was thus very difficult to predict the West African coinage requirements from one year to the next as demand depended largely on the success of the annual harvest and agricultural trade.[(1,4,5)]

1913 silver shilling
Measurements: 23.62mm, 5.654g (all shown 1.5×)
XRF metal: **Ag 94.4%, Cu 5.2%**
with Si, P, Zn, Au < 0.15%
Notes: Nominally 0.925 silver, but tests slightly higher, possibly due to surface enrichment after blanching. Have tested three high-grade specimens: 94.0%, 94.4% and 94.5%.

At the end of the war, and Britain debased its own silver coinage to 0.500 silver in 1920, the same was considered for West Africa. The 1920 issues include 0.925 from the London Mint, 0.500 from the Heaton Mint along with tin-brass issues from the Gaunt[(1,6)] and Kings Norton Mints, along with a pattern and some proofs. Shortages of coin in 1918 also resulted in an emergency issue of low denomination banknotes which led the way to other paper money issues.

1920 KN tin-brass shilling
Measurements: 23.57mm, 5.812g
XRF metal: **Cu 77.4%, Zn 18.0%, Sn 1.4%,**
Si 1.2%, S 1.2% with
Fe, P, Ni < 0.2%

The coins were quickly counterfeited, with all specimens seen having been made by casting, with the majority in a brass-coloured metal. Genuine coins are labelled in bold black and counterfeits in bold red. All coins shown at 150%.

1923 H tin-brass shilling
Measurements: 23.59mm, 5.551g
XRF metal: **Cu 78.4%, Zn 19.9%, Sn 1.2%,**
Al 0.3% with Pb, Fe, Mo < 0.07%

1923 counterfeit shilling in white metal
Measurements: 23.79-23.96mm, 5.179g
XRF metal: **Zn 95.1%, Cu 2.5%, Pb 1.3%,**
Si 0.6% with Cd, Fe, Sn < 0.1%
Notes: High zinc content, would have resembled silver when newly cast. Not quite round, but reasonable edge. Very underweight.

1924 tin-brass shilling
Measurements: 23.60mm, 5.638g
XRF metal: **Cu 76.3%, Zn 19.8%, Sn 1.2%,**
Si 1.0%, Al 0.8%
with Pb, S, Fe < 0.14%

1924 counterfeit shilling in brass
Measurements: 23.14-23.65mm, 5.332g
XRF metal: **Cu 66.8%, Zn 27.9%,**
Si 2.2%, S 1.5%, Al 1.0%
with P, Pb, Fe < 0.2%
Notes: Cast in a high zinc brass, with a very irregular edge, far from round and with a very dirty surface. Slightly under weight.

1926 tin-brass shilling
Measurements: 23.67mm, 5.639g
XRF metal: **Cu 76.2%, Zn 20.3%, Sn 1.3%,**
Al 0.8%, Si 0.8%,
with S, P, Pb < 0.4%

1926 counterfeit shilling in brass
Measurements: 23.03-23.06mm, 5.275g
XRF metals: **Cu 66.1%, Zn 28.7%,**
Si 1.7%, Sn 1.7%, Al 1.0%
with Pb, Fe, P < 0.4%
Notes: Cast in high zinc brass, porous surface, and not quite round, slightly underweight but very good edge.

Other counterfeit shillings from this series have been reported as follows: 1913 (Silvery appearance), 1922 KN, 1923, 1924 H, 1925 (Silvery appearance), 1928 and 1936.[(1)]

The activity and effects of counterfeiting in British West Africa has been the subject of serious study since the pioneering work of Toyin Falola in 1997.[7] The administration of West Africa regularly surveyed the coinage and noted the counterfeits, and thus data exists for the numbers found of each denomination and the geographical distribution.

The punishments for counterfeiting ranged from 7 to 14 years imprisonment and in 1926 to further dissuade the perpetrators, the punishment of public flogging was added to the statute books.[4,5] It would appear that there was collusion between official bodies; government, various branches of the local police forces and local administration leading to a far from impartial application of the law. Evidence was planted, false accusations made against local and business competitors and the wealthy could pay for charges to be dropped.

By the early 1930s counterfeiting was considered a sufficient problem that a solution needed to be found. At the same time there was a call for the coinage to be brought up to 0.500 fine, in line with that circulating in Britain. Whilst the latter didn't happen, a new security edge, invented by the Royal Mint, was proposed to be applied to future issues which would be difficult or even impossible to counterfeit.

The Introduction of the Security Edge

Specially designed edges were first applied to British coins in 1651, primarily to dissuade clippers, but also providing a barrier to simple cast and struck counterfeits.[8] The edges can be applied to the blank before the coin is struck, added to the coin during the striking process or added to the coin after it has been struck.

Graining, incuse lettering or grooves with engrailing can be applied to the blanks using a machine similar to the Castaing machine. This extra process takes time and costs money, but was typical of the milled coins and tokens issued prior to the recoinage of 1816.[9,10] Cooper[10] considers several methods of adding edge designs – edge rimming, beginning with the engraved strips used by Thomas Simon on the edge of the Petition Crown to the Castaing machine with its linear edging dies to curved dies used to add edges to the Maria Theresa Thaler.

After 1816 the majority of circulating coins were struck in a collar which guaranteed the diameter and could also impress vertical reeding or a legend as the blank expanded during striking. Further adding incuse or raised legends required a multi-segment collar to allow the coin to escape from the machine after striking.

In the early 1930s the Royal Mint started experimenting with a new type of security edge where a complex design would be added into a groove on the edge of the coin prior to being struck and the reeding added. The metal flow whilst being struck would make the groove narrower at the outer edge than it was it its base, making it impossible to cast.

1936 Specimen shilling with security edge

Measurements: 23.64mm, 5.686g,

XRF metals: Cu 78.4%, Zn 20.1%, Ni 1.3% with S, Si <0.1% very clean alloy

Notes: It has not been previously noticed that these trial strikings are in a new alloy, Nickel-Brass, which would be used for the British West Africa coinage from 1938 onwards and also used for the British dodecagonal three penny piece from 1937. The 1% Nickel as opposed to 1% Tin, provides a superior resistance to wear and corrosion/tarnishing, without a significant effect on cost or die life.

The whole process of creating the security edge is described in detail in a Royal Mint manual used during the training of apprentices in the coining department.[3] The subject is covered in Chapter XII and is brief enough to be reproduced in full below. The document is a masterpiece of concise explanation of some very detailed practical knowledge.[11]

N.B. In the following pages I have retyped all of the text and cleaned up the images from the original photostat copy. The pages have been sightly rearranged from the original foolscap to fit on A4. A few comments about terminology: 1 thou = 0.001" = 0.001 inches. In metric units 0.001" = 25.4 microns (µm) and in the USA is sometimes referred to as 1 mil, not to be confused with millimeters (mm). The hardness of various metals is given in V.P.N. (Vickers Pyramid Numbers). Conversions to Brinell and Rockwell hardness scales often used abroad can be found tabulated online.[12]

Chapter XII
Security Marking of Coins

Production of suitable blanks.
Preparation of security edge segments: -
- (a) Matrix
- (b) Roller
- (c) Segments

Machining operations on Matrix Roller and Segments.
Collars.
Dies.
Machine Setting.
Arrangement of Segments on the Edge-Marking Machine.

Coins with "Security Edges". This description has been given to coins having a pattern impressed on their edges in addition to the normal milling. The pattern, which may consist of a combination of half round beads and raised lines, is impressed at the bottom of a groove in the rim of the blank, before it is struck in the coining press. When these blanks are struck between the coining dies, the object is to produce a good impression of the obverse and reverse design, and, at the same time, to close sightly the sides of the groove in the rim of the coin, so leaving the bead pattern in an undercut groove. If this is accomplished, the resulting coin is most difficult to counterfeit by casting because of the undercut groove.

In practice, however, a perfect result is difficult to achieve. The obverse and reverse dies need to be of the correct curvature, so that pressure does not occur on the edge of the coin before the centre part of the design is perfectly made. The relation of the diameter of the edge-marked blank to the collar is very important, and it is also very important that the blanks should be of uniform hardness.

The process necessitates an additional operation and is somewhat costly; but many Governments consider the expense justified because of the decrease in the amount of counterfeiting when this device is adopted.

The security pattern is impressed on the rims of the blanks with a machine which resembles closely the engineers' shaping machine; reciprocating motion is given to the ram or slide of the machine and the small segments used for impressing the pattern in the groove are arranged as shown in fig. 120.

The design or pattern required for the complete circumference of the blank is divided into two halves; one half is used on the segment attached to the moving slide of the machine, and the other half on a segment fixed to the frame of the machine.

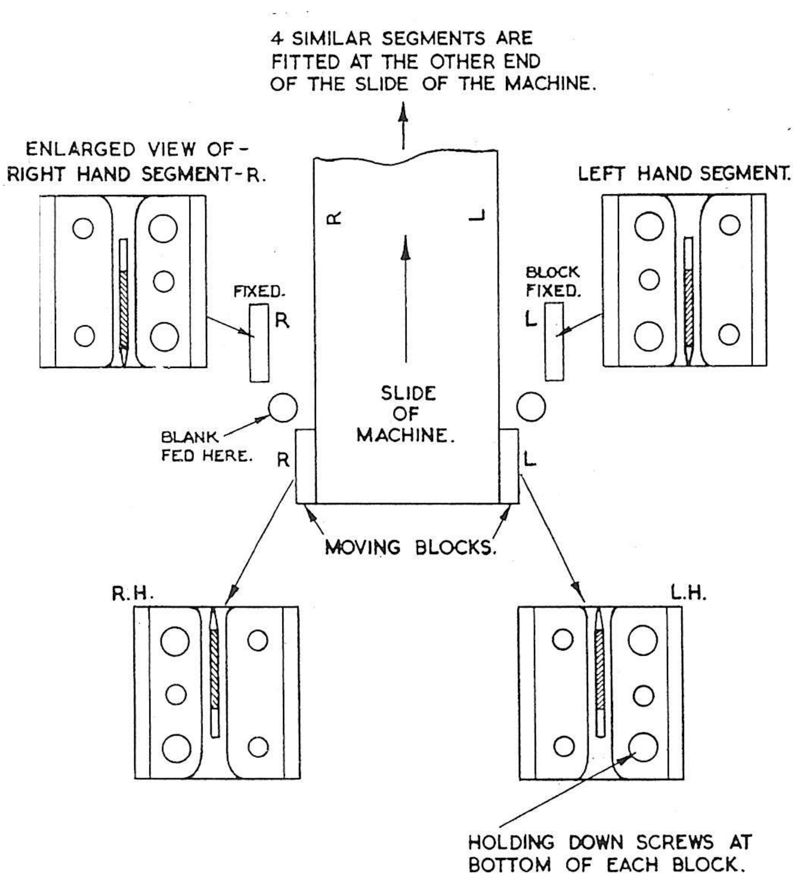


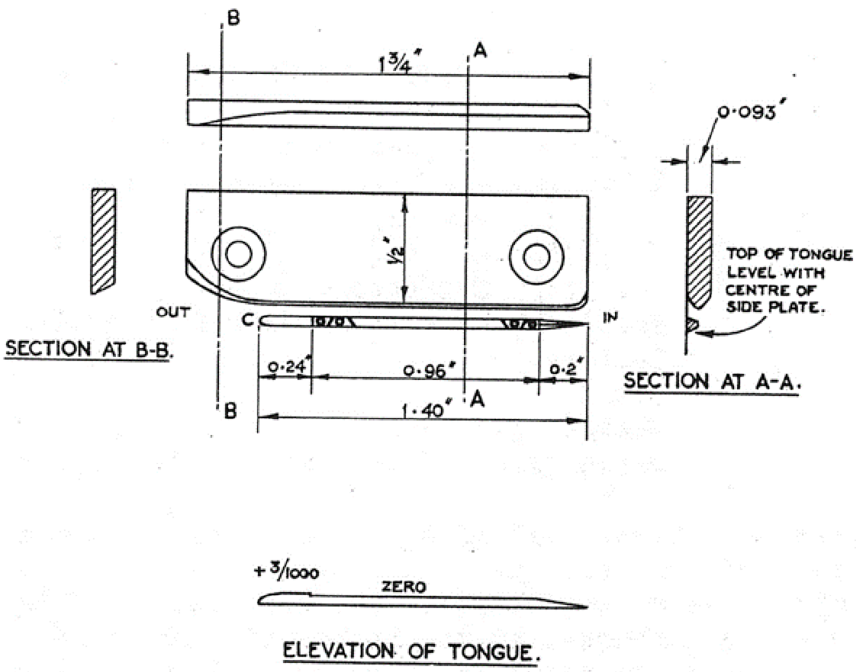
Fig. 120. Arrangement of security edge segments on machines (Right hand & left hand).

The blank is fed to the machine so that it lies in a horizontal plane. As the slide moves, the blank is picked up from the feed tube and rolled between the segment attached to the slide and the segment fixed to the frame of the machine.

In order to balance the side thrusts on the slide, it is usual to impress blanks on both sides of the slide as shown in fig. 120. Two additional pairs of segments may be fitted at the far end of the slide, if required. Making four pairs of segments working on one machine.

It is necessary to use a "tongue" to lead the blank to the security design and also to start the design in the centre of the rim of the blank (fig. 121).

A segment complete with tongue and guide plates is shown in fig.122. The guide plates ensure that the blank does not wobble whilst being impressed.



Note: - Termination of tongue at C must be arranged so it does not stamp out any of the "design" portion of the coin blank

Fig. 121. As used for British West Africa 6d coins.
Tongue in relation to one side-plate

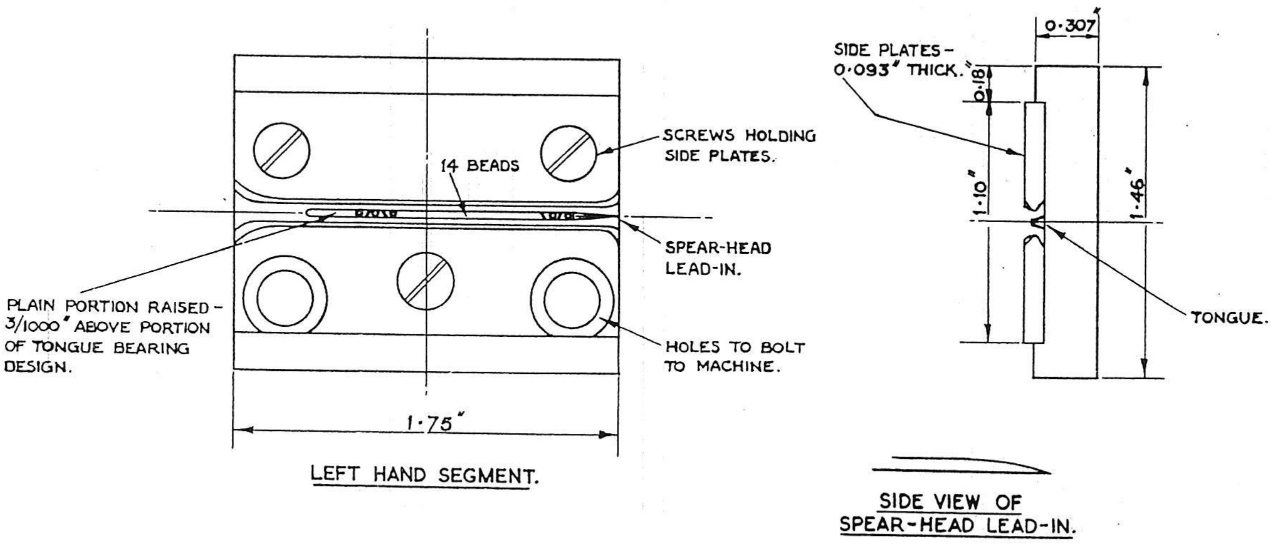


Fig. 122. As used for British West Africa 6d coins.
Segment complete with side-plates. Approx. full size.

Production of suitable blanks. – For grass, cupro-nickel, and silver coins the cut blanks should be annealed and the cannelured to produce a plain marked edge. They should then be security edge marked and finally struck in a coining press. For pure nickel blanks it is necessary to perform an additional annealing after canneluring.

The softness of the blank is important; when the blank is too soft, it buckles whilst receiving the “security” edge marking, and when too hard, it is difficult to impress the design to the desired depth without causing undue wear on the segments.

Good results have been obtained with the following V.P.N. values:-

Silver (916.6 sd.)	68-80
Brass	61-66
Cupro-Nickel	80-87
Pure Nickel	75-90

The following example shows the relative sizes of the blank at different stages of the process:-

British West Africa 6d Coins in Brass	Diam. In inches	Rim thickness in inches
Cut blank	0.772 to 0.774	0.053
Cannelured with plain marking	0.760 to 0.764	0.057 to 0.061
Security-rim-marked blank	0.749 to 0.757	0.063 to 0.072
Struck coin	0.764 to 0.767	0.069 to 0.072
Core diam. of collar	0.758	
Die neck diam.	0.757	
Depth of milling in collar	0.003 in.	

It will be seen from these figures that a blank 0.757 in. struck in a collar of diam. 0.758 in. has 0.006 in. milling and 0.002 in. spring after leaving the collar, giving a total of 0.766 in. overall diam. Of coin.

Attempts have been made to reduce wear on security rim segments by canneluring a plain groove into the rims of the blanks before finally security marking. So far, this has not proved successful. It is difficult to get the groove central, and there is a tendency for the cut blank to wander in the canneluring block.

Figure 123 explains the difficulty of centralizing the cut blank in the canneluring block.

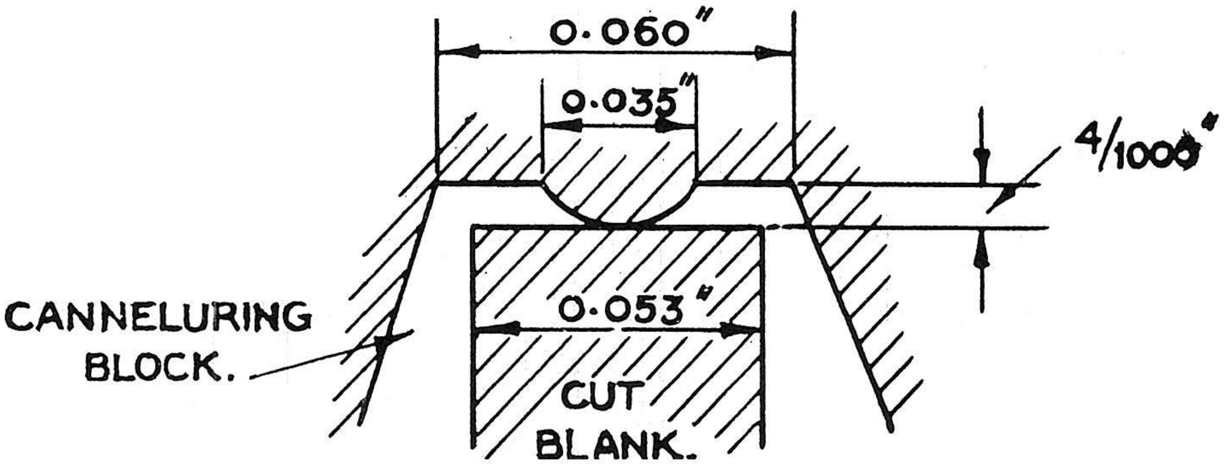


Fig. 123.

Further, it is found that when a central groove is produced, it has the disadvantage that , in the subsequent security rim-marking process, a wire edge is apt to be thrown up on each side of the security design. This tends either to break off and clog the segment or to remain on the finished coin and look unsightly.

Preparation of the "Security" rim Segments. (Lettered rim segments are produced by a similar process).

– This is done in three stages: -

(1) Machine or hand engrave a matrix with a suitable design,
(2) From this matrix pick up a roller using a Transfer Press.
(3) From the roller make segments using a Transfer Press

The matrix and the roller should be made in Sellers Transfer steel, (made by Messrs. John Sellers & Sons, 151, Arundel Street, Sheffield). This steel is specially suited to the transfer process, has a low carbon content and can be case hardened by the cyanide process.

Ordinary mild steel can be use for the segments.

The Matrix. Fig. 124 gives details of the matrix which was prepared for British West Africa 6d coins. The cross section of the tongue should follow closely the shape shown. The actual dimensions would vary slightly with different designs of security pattern, and with different metals to be impressed, but the shape of tongue shown would be a good guide.

Experience has shown that: -

(1) The sides of the tongue must be sloping and not upright (fig.125)
(2) The width, A, (fig. 125) at the top of the tongue should be as narrow as possible, consistent with retaining the impressed design intact. It will be appreciated that this dimension must not be decreased to the point where circular beads are impressed as oval beads. If this occurs the chamfering has been carried too far. The Narrow top of the tongue reduces the pressure necessary to impress the actual working segments into the rim of the coin blank. (The working segments are made from the roller produced from the matrix.)

Fig.126 shows an ideal shape for the narrow top of the tongue.

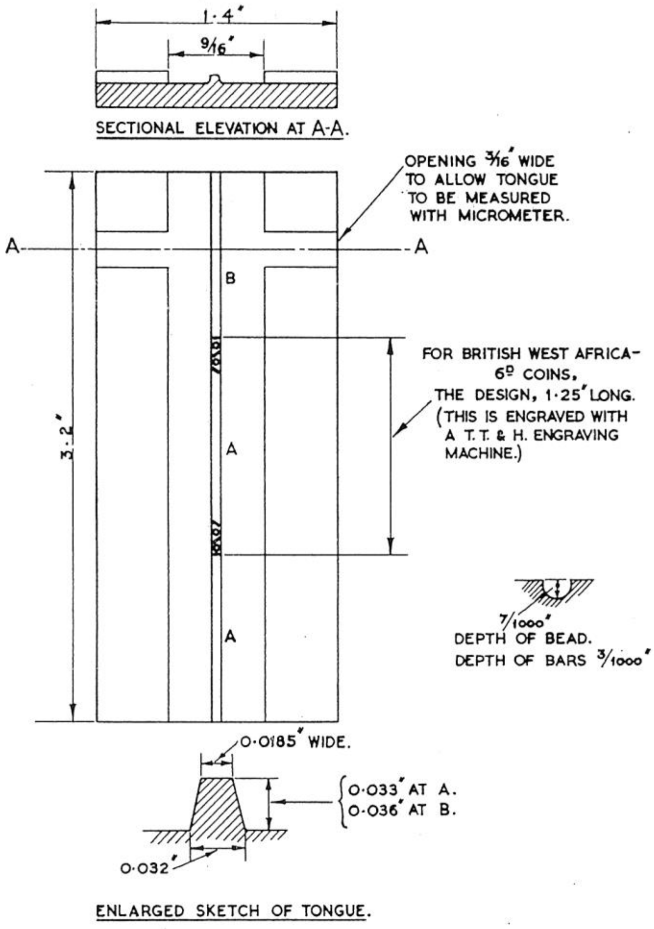


Fig. 124 Matrix (full size)

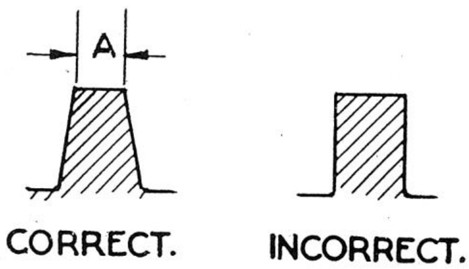


Fig. 125

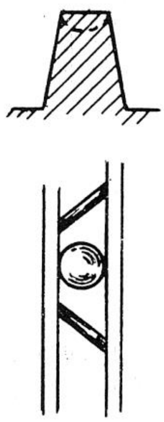


Fig. 126

The Roller. The roller is picked up from the matrix in a transfer press and then turned to the dimensions shown in fig. 127. It is made from a Sellers steel roller, 3” diam. And 1” wide, and is taper-bored in the centre to fit the mandrel used on the transfer press.

The hardness of the roller should be 750 V.P.N. The Mandrel should be of cast steel, correctly hardened, to avoid and danger of its breaking whilst transferring.

Segments. The general dimensions of the segments are shown in fig. 122.

One or two points call for special attention:

(1) The “lead in” of the plain tongue should be shaped like a spear head (fig. 128).. the object is to start a groove centrally on the rim of the blank, and to ensure a gradual deepening of this groove until the security design is reached. A more sudden “lead in” throws a small wave of metal in front of it, and spoils the first few beads of the design. It also tends to squeeze the blank more oval on shape than a gradual “lead in”.

(2) The plain portion of the rear of the design (see fig 122) should be raised 3/1,000 in. higher than the level of the design portion to ensure its stamping out any sign of the “lead in” produced by the other half segment. This results in a perfectly plain section between the two portions of the rim of the blank bearing the design. (fig. 129).

(3) The side plates must be finally stoned to shape and their alignment adjusted on the actual machine. Variations in batches of blanks, either in softness or diameter, will call for minor alterations to the shape of the side plates. Uniform annealing of the blanks is most important.

The enlarged sketch (fig. 130) is intended to show how the blank edge distorts and flows whilst being security marked. It will readily be appreciated that points, AA, on the side plates burnish and bend back the cross-hatched portions as the blank rotates during the marking process.

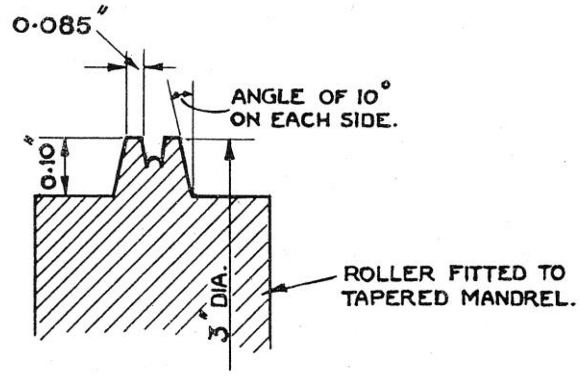


Fig. 127

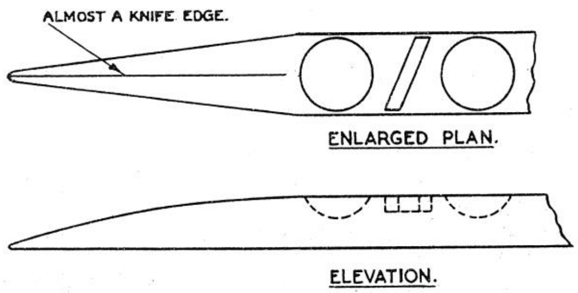


Fig. 128

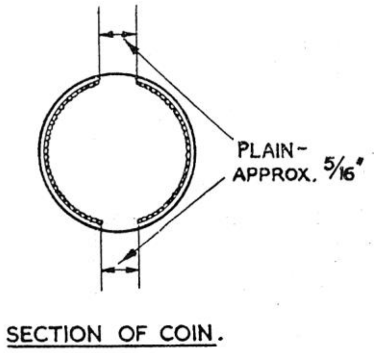


Fig. 129

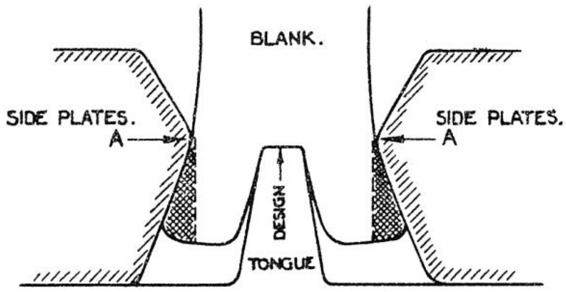


Fig. 130

The following is a description of the machining operations required for the various tools: -

Matrix.

(1) Rough away the metal leaving a tongue "over" size.
(2) On a Taylor, Taylor & Hobson pantograph engraving machine, using a zinc model, engrave the security design on the tongue of the matrix (fig. 124).
(3) On the T.T. & H. pantograph engraving machine cut the sides of the tongue to the correct cros section.
(4) Machine a slot for measuring the tongue with a micrometer (fig. 124).
(5) Harden in cyanide at 800°C for 1¾ to 2 hours to give a hardness of V.P.N. 675.

Roller.

(1) Prepare a roller with a raised portion to go into the slot in the matrix, and with a groove to fit exactly the tongue of the matrix (fig. 131).
(2) Transfer the design from the matrix using the Transfer Press.
(3) Finally machine the roller to dimensions shown in fig. 127.
(4) Harden in cyanide at 800°C for 2½ hours to V.P.N. 750.

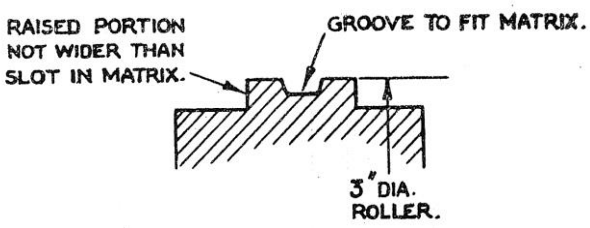


Fig. 131

Segments.

(1) From mild steel strip 10 in. × $1^1/_{16}$ in. × $^5/_{16}$ in. mill a groove on the T.T. & H pantograph machine to fit the rim of the roller (fig. 132).
(2) Anneal the strip.
(3) Roll in several impressions (four for British West Africa 6d coins).
(4) Flatten the strip under the hydraulic press.
(5) Mill the root of the tongue (fig. 133).
(6) Cut up accurately into lengths.
(7) Fit the side plates.
(8) Rout away the plain raised portion of the tongue to leave a suitable length for cancelling.
(9) Taper the lead-in.
(10) Harden segments and side plates at 800°C. for 1 ¾ hours to V.P.N. 700.
(11) Re-fit side plates, stoning by hand where necessary.

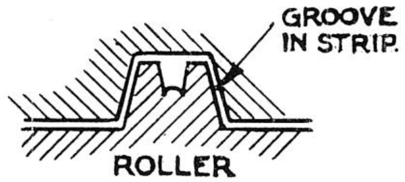


Fig. 132

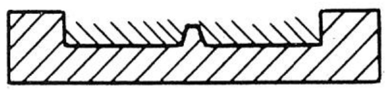


Fig. 133

Collars. It is important that the core diameter of the collars should be accurate within a tolerance of ± 1/2,000."

K.E. No. 169 special 3% nickel chrome case hardening steel has given good results. The makers, Messrs. Kayser Ellison & Co. of Sheffield, supply blanks 4" diameter sawn from bar.

The following sequence of operations has been found satisfactory: -

(1) Rough machine the collar and rough bore the hole.
(2) Normalise by heating to 880°/890°C – soak for five minutes and cool in air.
(3) Re-heat to 650°/680°C – soak for one to one and a quarter hours and cool in water.
(4) Finish the machining operations and mill. The milling is knurled with a hand tool in a lathe to a depth of 3/1,000": it is so fine and shallow that it is not possible to adjust the core diameter by grinding.

Dies. The curvature is very important. Experience has shown that a convex curvature of 3/1000 in. for coins 6d in size and 5/1000 in. 2/- size is approximately correct.

Die necks should be left slightly oversize and then ground to fit the collars.

The following example shows dimensions found to be successful for the Mauritius one rupee coins :-

Composition – silver 916.6		
Weight 180 grains		
Diam. of finished coin	30 mm. =	1.181”
Die neck diam.		1.170”
Diam. Of core of collar		1.172”
Cut blank diam. (on standard cutter)		1.84”
Rim thickness of blank		0.063”
Hardness after annealing	60 to 80 V.P.N.	
Plain – marked blank		1.179”
Rim thickness		0.069”

Machine Setting: **-** The shape of the feed tongue on the machine must be filed by hand to ensure that the blank is directed correctly to the edge of the security segments. The feed tubes cannot be set exactly on the centre line of the progression because of the thickness of the tubes. The feed tongue must, therefore, be shaped eccentrically to guide the blank as quickly as possible to the centre line of the progression (fig. 134).

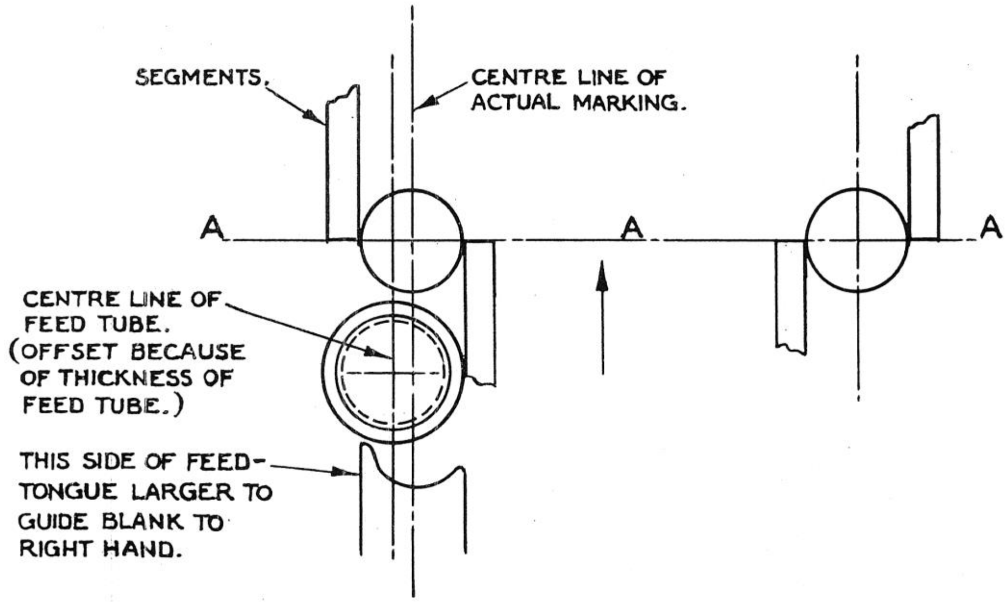


Fig. 134

Best results are obtained when all four corners are working,

It is very important that the segments at each side are in line (fig. 134), 1.e. line A.A.A. should pass through the centres of both blanks when just gripped by the segments.

[End of Pettiford Chapter XII]

British West African Coinage and Contemporary Counterfeiting Post 1938

The BWA Currency board decided to proceed with coins having security edges. The table below gives the cost of manufacture of the various denominations in different metals.[5] At the time silver was 21d per standard ounce, and Cu, Sn, Zn and Ni were £63, £230, £26 and £180 per ton. The cost was FOB (Free on Board – i.e. up to the point of export, not counting shipping).

The silver price didn't feel correct but on checking various online sources, the silver price in dollars per troy ounce has been plotted for the last 200 years[13] and the dollar-to-pound exchange rate over the past century[14] the numbers are correct.

			Metal			
Denomination	Weight (g)	Diameter (mm)	Sn-Br or Ni-Br	Cu-Ni	Pure Ni	0.500 Silver
2/-	11.310	28.499	34/-	40/6	79/8	381/9
1/-	5.655	23.622	20/6	24/3	43/4	198/3
6d	2.827	19.406	13/9	16/-	24/9	103/7
3d	1.413	16.256	10/6	12/-	17/-	57/6

Table 1. Manufacturing cost per 1000 pieces in 1937.

The Royal Mint quoted the cost of adding the security edge to 2/- and 1/- pieces at 3/- per 1000 pieces.[5]

The first coins with security edges were issued in 1938. Within months, counterfeits had appeared, cast in brass with crude grooves filed into the edges.

1938 Nickel-Brass shilling
Measurements: 23.67mm, 5.658g,
XRF metals: **Cu 78.3%, Zn 20.2%, Ni 1.1%,** Al 0.3% with Pb, Fe < 0.1%

1938 Brass counterfeit shilling
Measurements: 23.12-23.06mm, 5.416g,
XRF metals: **Cu 62.5%, Zn 34.6%,** Pb 1.3%, Al 1.0%, with Si Mo, Fe, Ni <0.5%

It has been commented that "The 1938 dated forgeries are excellent imitations and are only let down by the poor attempt at a security edge."[1] The same source also notes the existence of a 1947 counterfeit cast in lead.

1947 British Shilling on a Nickel-Brass blank with Security Edge
Measurements: 23.59mm, 5.652g,
XRF metals: **Cu 78.9%, Zn 18.1%, Ni 1.1%,** Si 1.4%, S 0.5% with Mo, Fe, Pb <0.02%

Notes: A blank with the security groove found its way into a press set up for Shillings with the English reverse design. The press would have been set up for the slightly harder cupro-nickel, and the higher forces have caused most of the metal around the security groove to spread outwards, with the security beads and lines reaching into and merging with the graining of the confining collar.

British Protectorate of Nigeria Coins and Contemporary Counterfeits

The security edge continued to be used on coins of the commonwealth, but the counterfeiters developed methods of adding the incuse design.

1959 Cupro-Nickel shilling
Measurements: 22.81mm, 4.977g,
XRF metal: **Cu 78.0%, Ni 20.5%,** Si 0.6%, S 0.4%, Mn 0.3%, Al 0.2% with Fe, Co, Se < 0.06%

1959 Counterfeit shilling #001
Measurements: 23.38-23.52mm, 5.623g,
XRF metals: **Pb 67.1%, Sn 17.7%, Sb 13.7%,** Si 2.8%, Al 0.8% with Cu, p, Zn < 0.3%
Notes: Similar to alloys used for printing type. Security edge partly filed, and partly with good beads and lines in groove. Very weak edge graining, mostly flat.

1959 Counterfeit shilling #002
Measurements: 22.97-22.97mm, 4.922g,
XRF metals: **Sn 59.3%, Pb 18.2%, Sb 14.6%, Cu 5.0%,** Si 1.6% with Al, Fe < 0.4%
Notes: A high-lead pewter. Complete security edge with beads and lines. Very good graining. Whole edge looks cast, but it isn't clear how the security edge was applied.

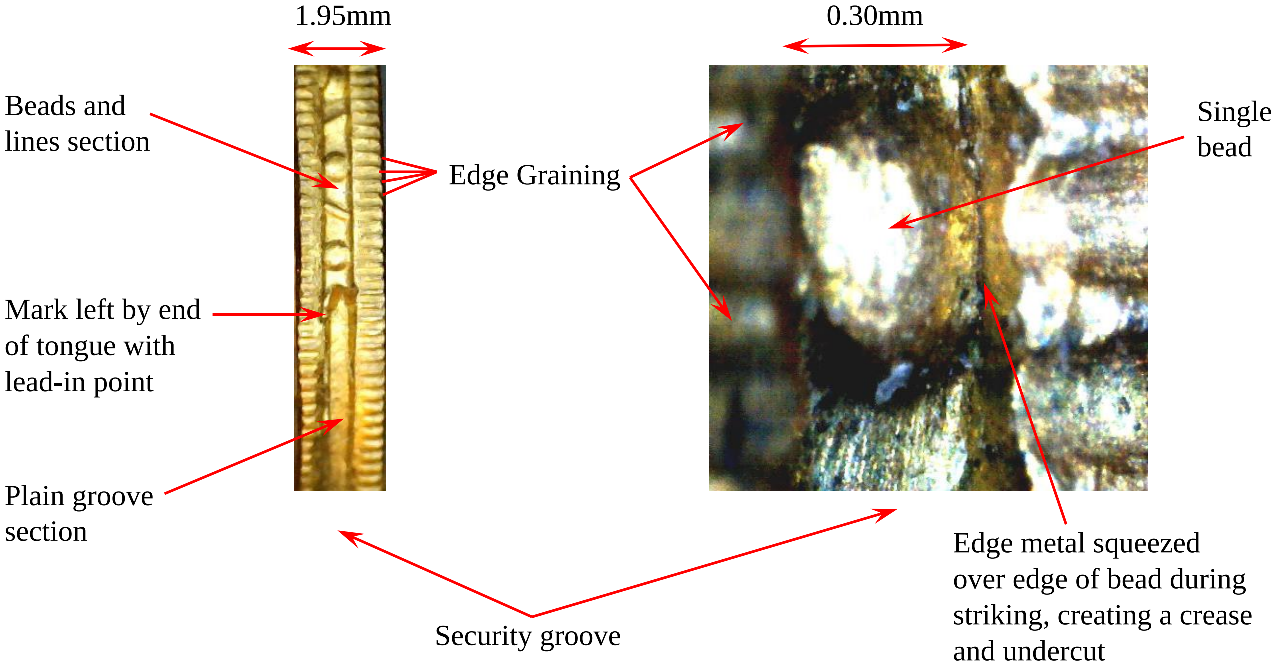
1959 Counterfeit shilling #003
Measurements: 23.28-23.08mm, 4.978,
XRF metals: **Sn 57.1%, Pb 22.2%, Sb 13.3%, Cu 4.1%,** Si 1.4%, Zn 1.1%, Al 0.6% with Cd, P < 0.1%
Notes: A high-lead pewter. Good graining all round, security groove partly filed and partly with very good beads and lines.

Conclusions

This note has described the British West African coinage issues, illustrated with shillings, starting with the silver, then the Nickel-Brass and then the introduction of the security edge on the 1938 issues onwards. A contemporary document describing the processes required to create the security edge has been reproduced.

The creation of the security edge requires two steps, the first the add the groove with beads and lines and the second is the when the coin design is stamped on the blank to slightly close up the groove. The metal flow is determined by the metal hardness (i.e. the previous annealing process) and the forces used (maintaining the groove whilst still imposing the edge milling) is a very subtle balance and if not correct much of the groove can be lost, as shown on the error striking of the English shilling.

Evidence of the process used to create the security edge can be seen by traces of the tongue used to centralise the blank during the caneluring process, as shown below on a 1940 West African shilling. During striking in a collar, the edge metal flows to close the groove and produce a sharp crease as it is squeezed over the beads.



Whilst the security edge does act as a deterrent to counterfeiters, the counterfeiters have a distinct advantage in that they are not obliged to put the correct date on their products. Thus whilst earlier issues remain in circulation, the counterfeiters will choose the easier dates to copy. In this way a 1923 counterfeit in white metal will blend in with the silver coins still in circulation. Genuine coins with a security edge were simply added to the existing circulating medium and the brass counterfeits without a security could continue to be made any time after the year shown on the counterfeit. As the true details of the security edge are too small to be seen by the unaided eye, the ingenious counterfeiters did tackle it with varying degrees of success.

By the late 1950s cast white metal counterfeits were in circulation in Nigeria, some with very convincing copies of the security edge.

Thus applying a security edge to new issues of a coinage that is already widely circulating is unlikely to have a significant effect on counterfeiting as the easier coins will continue to be copied. The only way to significantly impact counterfeiting is the completely replace the coinage with pieces that are more difficult to counterfeit, as happened recently with the dodecagonal bimetallic pounds replacing the round pounds.

References and Acknowledgements

(1) D. Vice. *The Coinage of British West Africa & St Helena 1684-1958*. Format, Birmingham, 1983.

(2) C.R. Bruce II (ed.). *Standard Catalogue of World Coins, 1901-2000*. 34th Edition, 2007, Krause Publications.

(3) P.H. Pettiford. *Notes on the Coining Process for Royal Mint Apprentices*. Printed for internal circulation at the Royal Mint. Unpublished, 1952. Spink Coin Auctions 47, lot 1241, 10 October 1985.

(4) A. Olukoju. Self-Help Criminality as Resistance?: Currency Counterfeiting in Colonial Nigeria. *International Review of Social History* 45 (2000), pp. 385–407. https://www.cambridge.org/core/services/aop-cambridge-core/content/view/14C9CAECBAA6C247FC9D3AD19B7F9DC6/S0020859000000225a.pdf/selfhelp_criminality_as_resistance_currency_counterfeiting_in_colonial_nigeria.pdf

(5) A. Olukoju. No Silver Bullet: Currency Counterfeiting and Countermeasures in British West Africa during the later 1930s. *Num. Chron*. 2019, pp357-371.

(6) G. Oddie. An Unusual 1920G Shilling from West Africa. *BNS Blog* 22 March 2019: https://britnumsoc.files.wordpress.com/2019/03/0025-oddie-west-africa-1920g.pdf
(7) T. Falola. Manufacturing Trouble: Currency Forgery in Colonial Southwestern Nigeria. *African Economic History*. No. 25 (1997), pp.121-147. https://www.jstor.org/stable/3601882?read-now=1&seq=21#page_scan_tab_contents
(8) G. Oddie. The Coinage Trials of 1651 - The Third Side of the Coin. *BNS Blog* 30 September 2021. https://britnumsoc.files.wordpress.com/2021/10/201-rev-1651-coinage-trials-oddie-001.pdf
(9) P. & B.R. Withers. *Copper Token Coins 1811-1820*. Galata Print Ltd., Llanfyllin. 1999.
(10) D.R. Cooper. *The Art and Craft of Coin Making*. Spink, 1988.
(11) P.P. Gaspar. *An introduction to 'Notes on the Coining Process for Royal Mint Apprentices' by P.H. Pettiford*. Unpublished, c.1985.
(12) https://www.a-i-t.com/cnc-machining-services/hardness-conversion-table
(13) Silver prices $/troy ounce. https://sdbullion.com/silver-price-by-year
(14) Dollar-Pound Exchange rate. https://www.exchangerates.org.uk/articles/1325/the-200-year-pound-to-dollar-exchange-rate-history-from-5-in-1800s-to-todays.html

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