Inventions and Innovations by People of African Descent

Patented breakthroughs and achievements beyond patents



48 PROFILES • SOURCE-BASED • QR-ENABLED

African and diaspora invention history in one reference booklet

Compiled by

Dr. John Terkunor Tetteh

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Inventions and Innovations by People of African Descent

Patented breakthroughs and achievements beyond patents

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Illustrated biographical edition · 2026

A source-based reference booklet presenting 48 profiles across manufacturing, household products, medicine, computing, energy and practical community innovation.

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Compilation and editorial material

Cover illustration uses conceptual motifs representing fields of invention.
Profile images are AI-generated illustrative renderings.

REFERENCE BOOKLET

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Click a contents entry to open its section. Original numbered technical references and profile QR destinations are retained; B references support the added personal-history sections.

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REFERENCE BOOKLET

Reading this booklet

This booklet documents 48 inventions and innovations by people born in Africa and across the African diaspora. It explains the specific contribution behind each name or product. The selection is illustrative, not exhaustive.

Dates identify a patent grant, publication, launch or documented period of development. Numbered references link to the supporting sources.

Understanding the evidence

Patented invention. A patent identifies a claimed device, design or process. A co-patent identifies shared inventorship.

Documented unpatented invention. An authoritative historical source explicitly states that the invention was not patented.

Work beyond patents. Published methods, practical adaptations, product development and business innovation may be significant without a patent cited here.

Unresolved attribution. Where surviving evidence is incomplete, the entry identifies that limitation rather than assigning an unsupported patent. Specific improvements should not become claims about inventing an entire technology.

QR codes, personal history and sources

Each original profile QR destination is retained for portrait or image-source research. These are separate from the new illustrative images. Numbered technical references remain the formal evidence citations. Personal Life Challenge sections use linked references B1–B30 where a specific account is documented; otherwise the evidence gap is stated.

About the illustrations

AI-generated images show representative inventions, reconstructions or applications. They are not archival photographs, verified portraits or authenticated patent drawings. Legacy and Impact sections explain the significance of the documented contribution.

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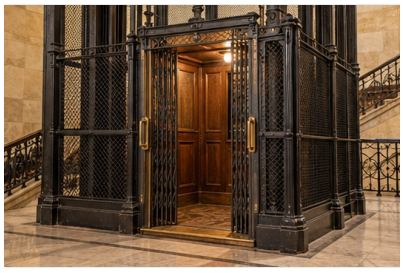
CHAPTER 01

Industry agriculture and transport

These inventions improved cleaning, crop planting, refining, manufacturing and transport. Many transformed an existing activity through a new mechanism or process.

Person, record & QR source	Contribution and significance
01 Thomas L. Jennings African American **1821** Patent US 3306X [1] QR SOURCE ARCHIVAL / OPEN  AI-generated illustrative rendering	**Dry-scouring clothes-cleaning process** Developed a process for cleaning clothing without the damage associated with conventional washing. His dry-scouring method was a predecessor to modern dry cleaning. Jennings is recognised as the first known African American to receive a US patent. **Personal Life Challenge [B1]** Worked against racial discrimination while building a business and supporting legal challenges to unequal treatment. His public work joined invention with the pursuit of civil rights. **Legacy and Impact** His work connected skilled tailoring with process invention, while his patent remains an important landmark in the documented history of African American inventorship.
02 Henry Blair African American **1834** Documented patent [2] QR SOURCE NO VERIFIED PORTRAIT  AI-generated illustrative rendering	**Mechanical seed planter** Developed a seed-planting machine intended to reduce agricultural labour by mechanising planting. The Smithsonian documents his 1834 patent as an important early example of African American participation in technological invention. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** Mechanising planting shows how agricultural knowledge can become a practical labour-saving device. His documented patent also broadens the historical record of American innovation.
03 Norbert Rillieux Louisiana-born; African and European ancestry **1846** Patent US 4,879 [3] QR SOURCE ARCHIVAL / OPEN  AI-generated illustrative rendering	**Multiple-effect evaporation for sugar refining** Developed a refining system that reused vapour through successive evaporation stages. It improved fuel efficiency, product quality and safety compared with open-kettle processing. This was a major contribution to chemical engineering, with applications beyond sugar production. **Personal Life Challenge [B2]** Racism in Louisiana and resistance to new technology constrained his career. He later returned to France as conditions for free Black people in the American South worsened. **Legacy and Impact** Reusing heat across successive stages remains an important engineering principle. His contribution links industrial efficiency with improved working conditions and product quality.

Person, record & QR source	Contribution and significance
04 Elijah McCoy Canadian-born; African American parentage; worked in the US **1872** Patent US 129,843 [4] QR SOURCE ARCHIVAL / OPEN  AI-generated illustrative rendering	**Automatic engine lubricator** His lubricator supplied oil to machinery while it operated, reducing the need to stop engines for manual lubrication. It became useful in locomotives and other heavy equipment, improving reliability and allowing machinery to run more continuously. **Personal Life Challenge [B3]** Despite engineering training, racial discrimination prevented him from securing work as an engineer. Railway employment gave him practical insight into the lubrication problem. **Legacy and Impact** Automatic lubrication reduced interruptions in machinery operation, illustrating how a focused improvement can increase the usefulness and dependability of an established technology.
05 Jan Ernst Matzeliger Suriname-born; African and Dutch ancestry; worked in the US **1883** Patent US 274,207 [5] QR SOURCE ARCHIVAL / OPEN  AI-generated illustrative rendering	**Automatic shoe-lasting machine** Mechanised the difficult operation of shaping a shoe upper around a last and attaching it to the sole. His machine increased production and helped make shoes more affordable, transforming an important stage of industrial shoemaking. **Personal Life Challenge [B4]** Developed prototypes after long factory shifts, using modest materials and secondhand drafting tools. Tuberculosis ended his life before he could enjoy the full commercial impact. **Legacy and Impact** Mechanising a difficult manufacturing stage helped expand shoe production and affordability. His achievement demonstrates the importance of observing skilled work before redesigning it.
06 Granville T. Woods African American **1887** Patent US 373,383 [6] QR SOURCE ARCHIVAL / OPEN  AI-generated illustrative rendering	**Railway induction and multiplex telegraph systems** Developed electrical communication systems involving moving trains and railway stations, supporting railway coordination and safety. His work also included other electrical technologies for rail transport. The cited patent concerns a railway telegraph system. **Personal Life Challenge [B5]** Establishing an independent inventive career required turning technical ideas into income. Selling rights to his telegraphony patent helped make full-time invention possible. **Legacy and Impact** His railway communication work helped connect moving equipment with information systems, showing that transport improvements depend on electrical coordination as well as mechanical power.

Person, record & QR source	Contribution and significance
07 Lewis H. Latimer African American **1882** Patent US 252,386 [7] QR SOURCE ARCHIVAL / OPEN  **Illustration focus** Improved manufacture of carbon filaments. A representative rendering of the invention or its application. The original QR opens the portrait/ image research trail; [7] identifies the technical evidence. AI-generated illustrative rendering	**Improved manufacture of carbon filaments** Improved the manufacture of carbon filaments for incandescent lamps, helping make electric lighting more practical and affordable. He also worked as a technical draughtsman and electrical expert. His recognised invention concerns filament technology; he should not receive sole credit for inventing the light bulb. **Personal Life Challenge [B6]** Built his technical career through self-directed learning rather than a conventional engineering degree, developing the drafting skills that opened opportunities in the patent world. **Legacy and Impact** Better filament manufacture helped make electric lighting more practical. His story highlights the essential role of materials and manufacturing improvements in widely shared technologies.
08 Alexander Miles African American **1887** Patent US 371,207 [8] QR SOURCE ARCHIVAL / OPEN  **Illustration focus** Automatic elevator-door mechanism. A representative rendering of the invention or its application. The original QR opens the portrait/ image research trail; [8] identifies the technical evidence. AI-generated illustrative rendering	**Automatic elevator-door mechanism** Developed mechanisms for automatically operating elevator cabin and shaft doors. These addressed the danger of doors being left open and people falling into shafts, improving the safety and convenience of an existing transport technology. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** Coordinating door operation addressed a serious everyday hazard. The invention illustrates how safety can be built into machinery rather than relying entirely on human attention.

CHAPTER 02

Household products and public safety

The original patent wording is especially helpful for everyday objects. A familiar product name can conceal an important distinction between an entirely new product and a new design for an existing one.

Person, record & QR source	Contribution and significance
09 Judy W. Reed African American **23 September 1884** Patent US 305,474 [9] QR SOURCE NO VERIFIED PORTRAIT  AI-generated illustrative rendering	**Improved dough kneader and roller** Designed rollers to knead and roll dough, with covered handling components. The patent concerns improvements to existing machinery. Her invention is directly verifiable, while claims about precisely which Black woman was first to patent an invention require separate historical scrutiny. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** The patent preserves a verifiable contribution to food machinery, even where biographical records remain thin. It makes her place in invention history inspectable.
10 Sarah E. Goode African American **1885** Patent US 322,177 [10] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Folding cabinet bed** Designed a bed that folded into furniture usable as a desk, helping people make better use of limited living space. The patent describes specific folding, balancing and support arrangements for this space-saving cabinet bed. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** Combining a bed and useful daytime furniture addressed limited living space. The design connects household observation with practical, adaptable product engineering.
11 Sarah Boone African American **1892** Patent US 473,653 [11] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Improved ironing board** Designed a narrow, shaped, reversible board particularly suited to ironing garment sleeves and seams. Her specification explicitly identifies an improvement to ironing boards. Accurate credit therefore concerns this specialised design, rather than the invention of the ironing board as an entire category. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** Her specialised board demonstrates that close knowledge of a task can produce a valuable design improvement without originating the entire product category.

Person, record & QR source	Contribution and significance
12 Philip B. Downing African American **1891** Patent US 462,093 [12] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Improved street letter box** Developed an improved mail-entry lid for street collection boxes, helping protect deposited letters. His patent expressly concerns improvements in letter boxes, providing a clear record of the particular protective design for which he deserves credit. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** Protecting deposited letters improved an everyday public service. Small mechanical changes can matter when a device must be reliable outside and used by many people.
13 Garrett A. Morgan African American **1914 and 1923** Signal patent US 1,475,024 [13] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Safety hood and three-position traffic signal** Developed a breathing hood used in rescue work and a mechanical traffic signal with an intermediate all-stop stage. Traffic signals already existed. His contribution should not be equated with inventing the first traffic signal or automatically with the first modern red amber green electric light. **Personal Life Challenge [B7]** Racist purchasing decisions obstructed sales of his safety hood. He used white representatives in demonstrations and advertising to overcome customers' refusal to buy from a Black inventor. **Legacy and Impact** His inventions addressed rescue and road safety. Precise credit recognises these advances while keeping the longer, collaborative history of traffic control visible.
14 Alice H. Parker African American **1919** Patent US 1,325,905 [14] QR SOURCE NO VERIFIED PORTRAIT  AI-generated illustrative rendering	**Gas-fired heating-furnace design** Proposed multiple independently controlled heating units feeding separate hot-air ducts, so that different parts of a building could be heated as required. The patent verifies this design. It does not, by itself, establish that Parker invented central heating or that her particular system entered widespread commercial use. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** Her patent records an approach to distributing and controlling heat. Its value can be recognised without assuming that the proposed system was widely manufactured.

Person, record & QR source	Contribution and significance
15 Marjorie Stewart Joyner African American **1928** Patent US 1,693,515 [15] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Permanent-wave machine** Developed a machine that mechanised part of the process of curling or straightening hair, addressing a time-consuming salon task. Her permanent-wave patent documents an important contribution to hair-treatment equipment and salon technology. **Personal Life Challenge [B28]** Exclusion from a white beauty trade-show contest helped spur her to organise alternative events that taught and supported African American beauty professionals. **Legacy and Impact** Her device brought mechanical thinking to salon work. It illustrates the technical creativity found in beauty services and other fields sometimes omitted from invention histories.
16 Marie Van Brittan Brown African American **1969** Co-patent US 3,482,037 [16] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Home security using television surveillance** With Albert L. Brown, developed an integrated system combining a camera, indoor viewing, two-way audio and remotely controlled door access. It was an important early home video-security design. Both inventors appear on the patent; the contribution should not be presented as her sole invention or as the invention of television. **Personal Life Challenge [B8]** Personal concern about home security helped motivate the invention. Her work brought practical household needs into a field where Black women's contributions were often overlooked. **Legacy and Impact** The patented combination anticipated important features of domestic video security. Preserving both inventors' names makes the collaborative achievement clear.
17 Mary Beatrice Davidson Kenner African American **1956** Patent US 2,745,406 [17] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Sanitary-belt design** Developed a sanitary-belt arrangement for holding a napkin in position. Her patented design addressed a practical menstrual-hygiene problem through the structure and support of the belt. The contribution should be identified as this particular design. **Personal Life Challenge [B9]** Financial constraints forced her to leave Howard University. She supported herself through employment and floristry while continuing to invent in her own time. **Legacy and Impact** Her design applied inventive attention to menstrual hygiene, demonstrating the importance of solving needs that established product markets can neglect.

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CHAPTER 03

Food science and medicine

An invention in these fields may be a manufacturing method, chemical synthesis, instrument or system of processing and preservation. Creating a useful process is distinct from discovering a naturally occurring substance.

Person, record & QR source	Contribution and significance
18 Joseph Lee African American **1894 and 1895** US 524,042 and 540,553 [18] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Dough-kneading and bread-crumbing machines** Developed machines to automate bread preparation and convert older bread into useful crumbs. These improved consistency, reduced labour and helped reduce kitchen waste. His patents document distinct improvements in bakery equipment and production. **Personal Life Challenge [B10]** Born into slavery, Lee later built a career through self-education and work in cooking and hospitality. Practical experience became the foundation for his machinery. **Legacy and Impact** His machinery joined efficiency with waste reduction. It shows how practical experience in kitchens can lead to improvements across a larger food-service industry.
19 Lloyd Augustus Hall African American **1920s–1930s** Patented processes [19] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Improved meat-curing preparations and preservation processes** Developed flash-dried salt mixtures that combined ingredients more effectively for meat curing, alongside other food-preservation innovations. His work improved product stability and industrial processing through better formulations and methods. **Personal Life Challenge [B11]** A company hired him by telephone but rejected him when he arrived because he was Black. He persevered and established a career in food chemistry. **Legacy and Impact** His work demonstrates how chemistry improves industrial food handling through formulations, stability and controlled processing, rather than through a single spectacular device.
20 George Washington Carver African American **1900s–1920s** Patents and work beyond patents [20] QR SOURCE ARCHIVAL / OPEN  AI-generated illustrative rendering	**Agricultural product development and practical chemistry** Developed uses for agricultural materials, including dyes, paints and wood stains, while promoting crop diversification and soil conservation. His record combines invention, applied chemistry and agricultural education. Product-use lists should not be interpreted as hundreds of separately patented inventions. Representative patents include US 1,522,176 and 1,541,478. **Personal Life Challenge [B29]** Faced racial exclusion from education, including rejection after admission to a college. He continued seeking schooling and ultimately built a career in agricultural science. **Legacy and Impact** His combination of research, agricultural education and practical product development highlights innovation that serves farmers and communities as well as industry.

Person, record & QR source	Contribution and significance
21 Percy Lavon Julian African American **1935** Published synthesis; later industrial patents [21] QR SOURCE ARCHIVAL / OPEN  AI-generated illustrative rendering	**Total synthesis of physostigmine** With Josef Pikl, established a synthetic route to physostigmine, previously obtained from the Calabar bean and used in glaucoma treatment. Julian later made major contributions to industrial natural-product and steroid chemistry. He developed ways to make valuable compounds; he did not discover or invent every naturally occurring compound involved. **Personal Life Challenge [B12]** Racial discrimination restricted educational and employment opportunities. He pursued research and industrial chemistry despite barriers that repeatedly limited access to scientific careers. **Legacy and Impact** His research showed how complex useful compounds could be made by synthesis. It links fundamental chemistry with the possibility of more practical industrial production.
22 Alice Augusta Ball African American **About 1915–1916** Historical chemical method [22] QR SOURCE ARCHIVAL / OPEN  AI-generated illustrative rendering	**Injectable chaulmoogra-oil derivatives known as the Ball Method** Developed a chemical method involving fatty-acid ethyl esters that made chaulmoogra preparations suitable for injection in Hansen's disease treatment. Her contribution illustrates the importance of scientific methods beyond patent records. It was an early treatment advance, subsequently superseded, rather than a modern cure for leprosy. **Personal Life Challenge [B13]** Died at just 24 before publishing her work. Proper recognition depended on later acknowledgement of her contribution, making her story a warning about lost scientific credit. **Legacy and Impact** Her treatment method and its delayed recognition underline the importance of giving scientists accurate credit, including for valuable work outside the patent system.
23 Charles Richard Drew African American **1940–1941** Methods and system development [23] QR SOURCE ARCHIVAL / OPEN  AI-generated illustrative rendering	**Standardised large-scale plasma processing and banking** Established procedures and standards for blood collection and plasma processing during Blood for Britain, then helped develop a national blood-banking programme. Others had already developed blood-storage techniques; Drew's achievement was improving and organising reliable systems at scale, including mobile donation arrangements. **Personal Life Challenge [B14]** Worked within a segregated medical profession and challenged restrictions on Black physicians. Training the next generation of surgeons became a major part of his response. **Legacy and Impact** His enduring contribution lies in dependable systems, standards and organisation. Scientific progress also depends on making procedures work reliably at large scale.

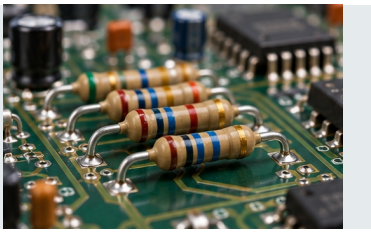
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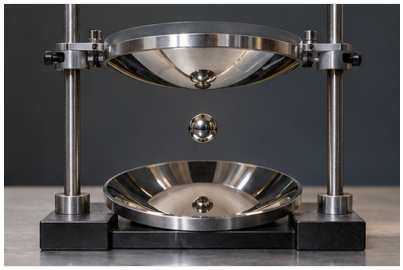
Person, record & QR source	Contribution and significance
24 Frederick McKinley Jones African American **Late 1930s onward** Patented equipment [24] QR SOURCE INSTITUTIONAL  **Illustration focus** Practical mobile refrigeration. A representative rendering of the invention or its application. The original QR opens the portrait/ image research trail; [24] identifies the technical evidence. AI-generated illustrative rendering	**Practical mobile refrigeration** Developed rugged refrigeration equipment suitable for transporting perishable goods. His work transformed the movement of food and other temperature-sensitive supplies over long distances. Accurate credit concerns transport refrigeration, rather than the original invention of the refrigerator. **Personal Life Challenge [B15]** Experienced disruption and hardship in childhood and entered work young. He developed mechanical expertise through practical jobs and sustained learning rather than a conventional academic path. **Legacy and Impact** Mobile refrigeration helped extend the reach of perishable supplies. His work illustrates the importance of adapting equipment to demanding transport conditions.
25 Patricia Era Bath African American **Conceived 1981; patent 1988** Patent US 4,744,360 [25] QR SOURCE ARCHIVAL / OPEN  **Illustration focus** Laserphaco cataract-removal device and technique. A representative rendering of the invention or its application. The original QR opens the portrait/ image research trail; [25] identifies the technical evidence. AI-generated illustrative rendering	**Laserphaco cataract-removal device and technique** Developed a laser-based device and associated technique for removing cataracts. Her Laserphaco invention combined a particular surgical approach with an instrument designed for that task, advancing technology used in eye care. **Personal Life Challenge [B16]** Built a career in a specialty in which Black women had little representation. Unequal access to eye care among Black patients became a central professional concern. **Legacy and Impact** Her invention links medical insight with instrument development. Her wider work also connected technological progress to the goal of more equitable access to eye care.

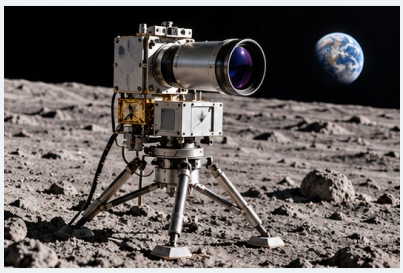
CHAPTER 04

Electronics computing and space

Many advances in communications, computing and scientific instrumentation arise through collaboration. These entries distinguish specific contributions from claims to have invented an entire technology.

Person, record & QR source	Contribution and significance
26 James E. West African American **Patent granted 1964** Co-patent US 3,118,022 [26] [27] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Foil-electret microphone** With Gerhard Sessler, co-invented a compact, sensitive microphone technology widely used in audio and communication devices. The contribution is the electret-microphone design, rather than the first microphone. The original patent confirms 1964 as the grant year, distinct from earlier development dates. **Personal Life Challenge [B17]** Grew up under segregation, when even hospital access was racially restricted. His family's experience illustrates the unequal conditions surrounding his path into science. **Legacy and Impact** The compact microphone design helped make sound capture practical in many devices. Shared credit recognises the collaboration behind a widely used component.
27 Otis F. Boykin African American **Patents from 1959** Patent US 2,891,227 [28] QR SOURCE ARCHIVAL / OPEN  AI-generated illustrative rendering	**Improved electrical resistors** Developed resistor technologies that improved electrical-current control and offered greater reliability or lower cost. His work also contributed to pacemaker technology. Credit should concern his electronic components and control improvements, rather than describing him as the sole inventor of the pacemaker. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** Improved resistors supported reliable electronic systems. His example shows why essential component engineering deserves recognition alongside the finished products it enables.
28 Mark E. Dean African American **1985** Co-patent US 4,528,626 [29] [30] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Microcomputer bus-control architecture** With Dennis Moeller, co-developed an architecture supporting communication with peripheral devices and contributed to personal-computer development. He was a major computer engineer and co-inventor, rather than the sole inventor of the computer or personal computer. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** His co-invented architecture supported flexible computer systems. The achievement makes clear how personal computing developed through many specialised, collaborative contributions.

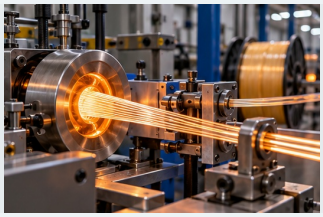
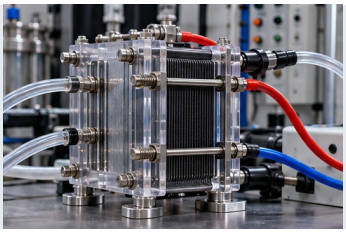
Person, record & QR source	Contribution and significance
29 Marian Rogers Croak African American **Career from the 1980s** Representative US 7,599,359 [31] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Voice over Internet Protocol technologies** Developed patented technologies that helped make internet-based voice communication more reliable and practical. She and her teams also developed a text-to-donate system. These substantial contributions should not be expanded into a claim that she alone invented the internet or all internet telephony. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** Her work helped voice communication operate over data networks. Reliable, usable systems depend on many engineering improvements as well as the original broad idea.
30 Valerie L. Thomas African American **1980** Patented optical system [32] [33] QR SOURCE ARCHIVAL / OPEN  AI-generated illustrative rendering	**Illusion transmitter** Developed an optical arrangement using concave mirrors to produce and transmit realistic-looking images. Separately, she contributed to Landsat image-processing systems. The illusion transmitter is a specific invention; calling her the inventor of television or all three-dimensional imaging would be too broad. **Personal Life Challenge [B18]** Early enthusiasm for electronics received limited encouragement, and her girls' school offered little support for advanced science. She pursued physics and a technical career nonetheless. **Legacy and Impact** Her optical invention and remote-sensing work connect imagination with technical systems. Accurate descriptions distinguish those separate contributions without overstating either.
31 Gerald "Jerry" Lawson African American **Launched 1976** Team product development [34] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Fairchild Channel F cartridge-based games console** Helped develop and led engineering work on a pioneering home console using interchangeable game cartridges. Consumers could change games without buying another console. Credit should recognise the wider team and earlier cartridge-related work, rather than presenting Lawson as the inventor of all video games. **Personal Life Challenge [B19]** Worked in a gaming industry with very few African American engineers. His career helped widen the visible possibilities for who could design consumer computing technology. **Legacy and Impact** Interchangeable cartridges changed how users obtained and played games. His engineering leadership belongs within the collaborative history of the console and its components.

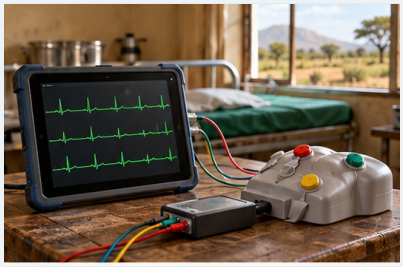
Person, record & QR source	Contribution and significance
32 Lonnie G. Johnson African American **1986** Patent US 4,591,071 [35] [36] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Pressurised water gun underlying the Super Soaker** Developed pressure-based water-gun technology commercialised as the Super Soaker. The patent documents a particular pressurised water-gun design. His wider engineering career also includes work on energy systems and spacecraft. **Personal Life Challenge [B20]** Grew up and attended school under segregation in Alabama. He continued developing his technical interests and later combined professional engineering with independent invention. **Legacy and Impact** His pressure-based design turned engineering insight into a successful consumer product, showing how experimentation can create opportunities outside an inventor's original professional field.
33 Emmett W. Chappelle African American **1960s onward** Patent US 3,423,290 [37] QR SOURCE ARCHIVAL / OPEN  AI-generated illustrative rendering	**Bioluminescence-based detection methods** Developed ways to use light-producing biochemical reactions to detect biological material, including bacteria. He also advanced fluorescence methods for assessing plant condition, turning natural phenomena into useful analytical techniques. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** His work translated natural light-producing processes into tools for measurement, demonstrating the inventive value of connecting biology, chemistry and instrumentation.
34 George R. Carruthers African American **Apollo 16 deployment 1972** Scientific instrument development [38] QR SOURCE ARCHIVAL / OPEN  AI-generated illustrative rendering	**Far-ultraviolet camera and spectrograph** Developed specialised astronomical instrumentation used to observe ultraviolet emissions from Earth and celestial objects from the Moon. The far-ultraviolet camera and spectrograph was deployed during Apollo 16 in 1972, extending the reach of space-based observation. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** The instrument extended observations into ultraviolet wavelengths from the lunar surface. It shows how new tools can open scientific questions to direct investigation.

CHAPTER 05

Contemporary African innovation

African-born innovators have developed inventions within Africa and through institutions and companies overseas. Their work spans manufacturing, energy, healthcare, water treatment and consumer products.

Person, record & QR source	Contribution and significance
35 Thomas Owusu Mensah Ghanaian-born; worked in the US **1980s; cited patent 1988** Co-patent US 4,792,347 [39] [40] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Optical-fibre manufacturing improvements** Co-invented processes improving optical-fibre coating and manufacture. The cited patent names Charles Deneka, Gitimoy Kar and Thomas Mensah, and concerns reducing problems during fibre coating. Mensah helped improve the manufacturability and economics of fibre optics; he did not originate optical fibre itself. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** Manufacturing advances helped make optical-fibre technology more practical. His contribution shows why reliable production is an important part of technological progress.
36 Sossina M. Haile Ethiopian-born American scientist **Landmark paper 2001** Published team research [41] [42] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Solid-acid fuel cells** With Dane Boysen, Calum Chisholm and Ryan Merle, demonstrated solid-acid electrolytes in fuel cells. Their 2001 research opened a distinct route for electrochemical energy conversion through a class of materials with useful proton-conducting properties. **Personal Life Challenge [B21]** Her family fled Ethiopia after a military coup in the 1970s. Displacement formed part of the background to her later international scientific career. **Legacy and Impact** The research opened a materials route for fuel-cell development. Her example connects fundamental understanding of solids with potential advances in energy conversion.
37 Samuel Achilefu Nigerian-born; worked in the US **Used in surgery in 2014** Team imaging-system development [43] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Wearable cancer-imaging goggles** Led a team combining imaging technology, a head-mounted display and fluorescent imaging agents to help surgeons distinguish cancerous tissue. The goggles represent an innovation in surgical imaging and guidance, documented in operating-room use in 2014. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** The goggles linked imaging research with a practical surgical task. The achievement depends on coordinated work across chemistry, engineering and clinical practice.

Person, record & QR source	Contribution and significance
38 Arthur Zang Cameroonian **Documented 2014; Africa Prize 2016** Medical product development [44] [45] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Cardiopad** Developed a portable medical-tablet system for acquiring heart-test data and transmitting it to distant specialists. The Cardiopad integrates medical data collection with remote communication to improve access to cardiac assessment in underserved locations. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** Portable data collection and remote specialist review offer a way to address geographic gaps in care. The innovation brings several established technologies into a useful system.
39 Askwar Hilonga Tanzanian **Africa Prize 2015** Team process and product development [45] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Nanofilter water-treatment system** With his team, developed a system integrating sand filtration and nanotechnology, with treatment configured for local water-contamination conditions. Its significance lies in an adaptable approach to water treatment, recognised by the Africa Prize in 2015. **Personal Life Challenge [B22]** Growing up in rural Tanzania, he experienced waterborne diseases himself. That personal experience helped connect his scientific training to the need for safer drinking water. **Legacy and Impact** Locally configured water treatment connects advanced materials with community needs. Its significance includes adapting a solution to the contaminants actually present.
40 Ludwick Marishane South African **Recognised by 2011** Product formulation and development [46] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**DryBath body-cleansing product** Developed a lotion intended to enable body cleansing without a conventional water bath. University of Cape Town records document the product and its innovation awards. Credit is appropriate for DryBath; claims that it was the first waterless cleanser of any kind, or claims of medical effectiveness, need separate evidence. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** DryBath demonstrates product innovation directed at an everyday need. Its achievement should be distinguished from broader claims about all waterless cleansing products.

CHAPTER 06

Achievements beyond patents

This chapter includes a documented unpatented invention, historically reported inventions without a securely attributed patent, practical adaptations and wider scientific or entrepreneurial achievements. These categories are identified explicitly. Absence of a patent citation is not proof that no patent exists anywhere, and a brand name is not a patent.

Person, record & QR source	Contribution and significance
41 Lewis Temple African American **1848** Documented unpatented invention [47] [48] QR SOURCE NO VERIFIED PORTRAIT  AI-generated illustrative rendering	**Improved toggle harpoon** Developed the Temple toggle iron, an improved harpoon head that pivoted after entry and resisted pulling free. Whalers widely adopted the design. The National Park Service states that Temple never patented it; the Smithsonian clarifies that he improved the toggle rather than inventing its underlying principle. This is a strong example of important invention outside the patent register. **Personal Life Challenge [B30]** An accident interrupted his plans for a new workshop and led to his death. He did not live to work in the shop being built for him. **Legacy and Impact** Widespread adoption of an unpatented improvement illustrates why invention history must look beyond patent ownership and acknowledge working craftspeople.
42 Benjamin Banneker African American **1753** Historical engineering achievement [49] QR SOURCE NO VERIFIED PORTRAIT  AI-generated illustrative rendering	**Construction of a wooden clock** Constructed a wooden clock and later produced astronomical calculations and almanacs. His clockmaking is a recognised example of skilled, self-directed engineering before the modern US patent system. He did not invent the clock, and claims that his was the first clock in America are too broad. His surveying work also should not be confused with authorship of Washington's city plan. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** His engineering and mathematical work demonstrate the power of self-directed study. Accurate recognition can celebrate that achievement without repeating unsupported "first" claims.
43 Ellen F. Eglin African American **Reported sale in 1888** Reported invention; patent attribution unresolved [50] QR SOURCE NO VERIFIED PORTRAIT  AI-generated illustrative rendering	**Clothes-wringer improvement** A historical account describes Eglin selling a clothes-wringer invention for $18 rather than marketing it under her own name because of racial prejudice. Smithsonian research highlights the difficulty of identifying her design in patent records. Her inventive contribution deserves recognition, but assigning a specific patent to her or reconstructing an exact mechanism without evidence would go beyond the record. **Personal Life Challenge [B23]** Feared that white buyers would reject a product associated with a Black woman. The surviving account records how prejudice affected both recognition and financial reward. **Legacy and Impact** Her story exposes how market prejudice and incomplete archives can hide inventive work. Recognition therefore requires careful handling of both evidence and uncertainty.

Person, record & QR source	Contribution and significance
44 Madam C. J. Walker African American **Early 1900s** Product and business innovation [51] QR SOURCE ARCHIVAL / OPEN  AI-generated illustrative rendering	**Hair-care products and the Walker business system** Developed and commercialised hair-care products and a business system serving Black women. This is an important record of product and entrepreneurial innovation, presented here without a patent attribution. The Smithsonian expressly rejects the common claim that Walker invented the hot comb. Her achievement is best understood alongside Annie Turnbo Malone and the wider beauty industry. **Personal Life Challenge [B24]** Endured childhood orphanhood, hard physical work and early widowhood before establishing her enterprise. Her business grew from the demanding conditions of her own working life. **Legacy and Impact** Her enterprise connected products, sales networks and opportunity for Black women. This is a substantial entrepreneurial achievement without needing the incorrect hot-comb claim.
45 Annie Turnbo Malone African American **Early 1900s** Product and business innovation [51] QR SOURCE ARCHIVAL / OPEN  AI-generated illustrative rendering	**Poro hair-care enterprise and professional training** Pioneered a Black hair-care enterprise and training network that helped establish the commercial path later associated with Walker. Her work is included for product development and business innovation; no specific patent is asserted here. The Smithsonian places Malone and Walker within an interconnected history. **Personal Life Challenge** A specific personal-life hardship is not established by the sources used for this profile. The documented contribution is retained without adding an unsupported biographical account. **Legacy and Impact** Her work joined product development with professional training, demonstrating how an innovation can include the organisation that spreads skills and creates livelihoods.
46 William Kamkwamba Malawian **Early 2000s** Practical adaptation; documentary evidence [52] QR SOURCE INSTITUTIONAL  AI-generated illustrative rendering	**Locally built wind-powered electricity system** As a teenager, used ideas from a library book and salvaged components to build a windmill that brought electricity to his family. The achievement lies in resourceful engineering under severe constraints, not in inventing the windmill or wind power. His contribution is documented through his engineering work and personal account; no patent claim is needed to recognise it. **Personal Life Challenge [B25]** Famine and the inability to afford school fees interrupted his education. Library books and salvaged materials allowed him to keep learning and build a working energy system. **Legacy and Impact** His project shows how access to knowledge and resourceful adaptation can address local needs. Its importance rests on practical achievement rather than novelty in wind power itself.

Person, record & QR source	Contribution and significance
47 Richard Turere Kenyan Maasai innovator **Publicly presented 2013** Documented invention; no patent claim here [53] QR SOURCE INSTITUTIONAL  **Illustration focus** Lion Lights livestock-protection system. A representative rendering of the invention or its application. The original QR opens the portrait/ image research trail; [53] identifies the technical evidence. AI-generated illustrative rendering	**Lion Lights livestock-protection system** Designed a system of lights using accessible electrical components and solar charging to discourage nocturnal lion attacks on livestock. His TED account documents the invention and the problem it addressed. Inclusion in this chapter does not establish the absence of later intellectual-property protection. **Personal Life Challenge [B26]** As a young herder, faced repeated lion attacks on the family's cattle. He sought a practical way to protect livestock without killing the predators. **Legacy and Impact** His system connects locally available electronics with coexistence between people and wildlife. It illustrates how observing behaviour can inspire a useful engineering response.
48 Katherine G. Johnson African American **1960 report; 1961–1962 missions** Published mathematics; not a device invention [54] QR SOURCE ARCHIVAL / OPEN  **Illustration focus** Orbital-flight calculation methods and trajectory analysis. A representative rendering of the invention or its application. The original QR opens the portrait/ image research trail; [54] identifies the technical evidence. AI-generated illustrative rendering	**Orbital-flight calculation methods and trajectory analysis** With Ted Skopinski, co-authored a report describing orbital-flight calculations for a specified landing position. She also performed trajectory analysis and checked calculations for early human spaceflight. This is a major scientific and computational contribution beyond patent-based recognition. Johnson is included as a mathematical innovator, not as the inventor of the spacecraft or the computer. **Personal Life Challenge [B27]** Pursued education and mathematical work amid segregation and gender bias. Her achievements reflect sustained technical ability in institutions where opportunity was unequal. **Legacy and Impact** Her calculations supported confidence in spaceflight planning. The story highlights rigorous mathematical work as a form of innovation that is not captured by patents alone.

REFERENCE BOOKLET

Giving precise credit

Accurate wording strengthens recognition. These examples replace familiar broad claims with contributions supported by the historical record.

Common broad claim	More accurate wording
Latimer invented the light bulb	Latimer patented an improved method of manufacturing carbon filaments for incandescent lamps. Profile 07 · [7]
Morgan invented traffic lights	Morgan patented an important three-position mechanical signal; traffic signals already existed. Profile 13 · [13]
Boone invented the ironing board	Boone patented a specialised ironing-board improvement for sleeves and garment seams. Profile 11 · [11]
Jones invented the refrigerator	Jones pioneered practical mobile refrigeration for transporting perishable goods. Profile 24 · [24]
Drew invented blood banking on his own	Drew standardised and scaled plasma collection, processing and banking, building on earlier work. Profile 23 · [23]
Dean invented the computer	Dean co-invented important computer architecture and contributed to IBM personal computers. Profile 28 · [29] [30]
Mensah invented fibre optics	Mensah co-invented significant improvements to optical-fibre coating and manufacture. Profile 35 · [39] [40]
Walker invented the hot comb	Walker developed hair-care products and enterprise; the hot-comb claim is contradicted by Smithsonian research. Profile 44 · [51]
Banneker invented the clock	Banneker constructed a notable wooden clock in 1753; clockmaking long predated him. Profile 42 · [49]
Kamkwamba invented the windmill	Kamkwamba adapted existing wind-power principles and salvaged parts to meet a local electricity need. Profile 46 · [52]

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REFERENCE BOOKLET

Research notes

How the entries were selected

The catalogue prioritises contributions supported by patents, archival or museum records, universities, scientific publications and institutional accounts. Patents help establish names, dates and technical claims; biographical and historical sources provide context.

Why patent records are not the whole story

Historical records of Black invention are incomplete. Patent examiner Henry E. Baker helped document inventions by African Americans. This booklet uses patent records alongside other documentary evidence and identifies uncertainty. [55]

A missing patent citation does not prove that no patent exists, nor does a patent alone establish that its holder originated an entire technology or successfully commercialised it. Published science, practical engineering and enterprise are labelled separately.

Personal history and responsible interpretation

The Personal Life Challenge sections distinguish documented personal or professional obstacles from gaps in the available biography. General historical discrimination is not treated as proof of a particular event in every person's life. References B1–B30 identify the sources used for these additions.

What this illustrated revision changes

The 48-profile sequence, patent details, original QR destinations and numbered technical references are retained. Incomplete sentences in the supplied PDF have been repaired to express the intended narrow contribution. New images are illustrative; Legacy and Impact passages explain significance rather than establish new priority claims.

Scope of the original social-media reference

The TikTok video that prompted the original research could not be independently reviewed for that compilation. This booklet remains an independent, source-based selection; no entry is presented as a verified claim made in that video.

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REFERENCE BOOKLET

Sources and further reading

Numbers correspond to the technical references in the profiles. Linked titles open supporting records; patent links provide the full specification.

[1] National Inventors Hall of Fame — Thomas Jennings

[2] Smithsonian American Art Museum Inventing Equality

[3] National Inventors Hall of Fame — Norbert Rillieux

[4] National Inventors Hall of Fame — Elijah McCoy

[5] National Inventors Hall of Fame — Jan Ernst Matzeliger

[6] National Inventors Hall of Fame — Granville Woods

[7] National Inventors Hall of Fame — Lewis Latimer

[8] National Inventors Hall of Fame — Alexander Miles

[9] US 305474 Dough kneader and roller

[10] US 322177 Cabinet-bed

[11] US 473653 Ironing-board

[12] US 462093 Letter-box

[13] National Inventors Hall of Fame — Garrett Morgan

[14] US 1325905 Heating furnace

[15] US National Archives — Marjorie Joyner permanent-wave patent

[16] US 3482037 Home security system utilizing television surveillance

[17] US 2745406 Sanitary belt

[18] National Inventors Hall of Fame — Joseph Lee

[19] National Inventors Hall of Fame — Lloyd Augustus Hall

[20] National Inventors Hall of Fame — George Washington Carver

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REFERENCE BOOKLET

Sources and further reading

Numbers correspond to the technical references in the profiles. Linked titles open supporting records; patent links provide the full specification.

[21] American Chemical Society Percy Lavon Julian

[22] University of Hawai‘i Alice Ball and the chaulmoogra tree

[23] US National Library of Medicine Charles Drew biographical overview

[24] National Inventors Hall of Fame — Frederick McKinley Jones

[25] National Inventors Hall of Fame — Patricia Bath

[26] US 3118022 Electroacoustic transducer

[27] National Inventors Hall of Fame — James E. West

[28] National Inventors Hall of Fame — Otis Boykin

[29] US 4528626 Microcomputer system with bus control means

[30] National Inventors Hall of Fame — Mark Dean

[31] National Inventors Hall of Fame — Marian Croak

[32] Lemelson MIT Valerie Thomas

[33] NASA A Face Behind Landsat Images

[34] Computer History Museum Let the Games Begin

[35] US 4591071 Squirt gun

[36] National Inventors Hall of Fame — Lonnie Johnson

[37] National Inventors Hall of Fame — Emmett W. Chappelle

[38] NASA Carruthers and the Apollo 16 ultraviolet camera

[39] US 4792347 Method for coating optical waveguide fiber

[40] AIChE In Memoriam Thomas Mensah

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REFERENCE BOOKLET

Sources and further reading

Numbers correspond to the technical references in the profiles. Linked titles open supporting records; patent links provide the full specification.

[41] Haile and colleagues Solid acids as fuel cell electrolytes Nature 2001

[42] Northwestern University Basic Science Leads to Sustainable Solutions

[43] Washington University Special glasses help surgeons see cancer

[44] WIPO Cardiopad Reaching the Hearts of Rural Communities in Africa

[45] Royal Academy of Engineering Africa Prize winners

[46] University of Cape Town Student awash with awards for bath-substituting lotion

[47] US National Park Service Lewis Temple

[48] Smithsonian Temple Toggle Iron

[49] US National Park Service Banneker and the Boundary Stones

[50] Smithsonian Lemelson Center Who Invents and Who Gets the Credit

[51] Smithsonian NMAAHC Sizzle The complicated history of the hot comb

[52] Dartmouth — William Kamkwamba: engineering and education

[53] TED Richard Turere and Lion Lights

[54] NASA Katherine Johnson biography

[55] USPTO — Henry E. Baker and the history of Black inventors

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Personal-history sources

B references support the Personal Life Challenge sections. Click a title to open the source.

[B1] NIHF — Thomas Jennings

[B2] NIHF — Norbert Rillieux

[B3] NIHF — Elijah McCoy

[B4] NIHF — Jan Ernst Matzeliger

[B5] NIHF — Granville Woods

[B6] NIHF — Lewis Latimer

[B7] NIHF — Garrett Morgan

[B8] Princeton University — Marie van Brittan Brown

[B9] Lemelson–MIT — Mary Beatrice Davidson Kenner

[B10] NIHF — Joseph Lee

[B11] NIHF — Lloyd Augustus Hall

[B12] American Chemical Society — Percy Lavon Julian

[B13] University of Hawai‘i — Alice Ball celebrated

[B14] US National Library of Medicine — Charles R. Drew

[B15] NIHF — Frederick McKinley Jones

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Personal-history sources

B references support the Personal Life Challenge sections. Click a title to open the source.

[B16] NIHF — Patricia Bath

[B17] NIHF — James E. West

[B18] Lemelson–MIT — Valerie Thomas

[B19] Centre for Computing History — Jerry Lawson

[B20] Smithsonian Lemelson Center — Lonnie Johnson

[B21] Northwestern University — Basic Science Leads to Sustainable Solutions

[B22] World Health Organization — Askwar Hilonga

[B23] Smithsonian Lemelson Center — Who Invents and Who Gets the Credit?

[B24] Library of Congress — Madam C. J. Walker

[B25] Dartmouth — A Conversation with William Kamkwamba

[B26] TED — Richard Turere: My invention that made peace with lions

[B27] NASA — Katherine G. Johnson

[B28] US National Archives — Marjorie S. Joyner

[B29] US National Park Service — George Washington Carver

[B30] US National Park Service — Lewis Temple

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QR and image research notes

Why the QR codes sit beside each profile

The original portrait and image-source research is integrated into the 48-profile catalogue so readers can follow the research trail beside the relevant inventor. These original QR destinations are retained. They concern portrait or image provenance and related research; the numbered technical references and B references support the written claims.

Source-status key

Archival / Open. The prior source register identified a public-domain, government or openly licensed portrait/source.

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No verified portrait. The prior register did not locate a verified portrait. A source trail is retained without presenting a generated face as a historical likeness.

The new invention illustrations

All 48 profile images are AI-generated illustrative renderings of an invention, a representative reconstruction or an application. They are educational visual aids, not evidence of the exact patented mechanism, brand, production model or historical appearance. No generated inventor portraits are used.

For example, the clothes-wringer image beside Ellen Eglin represents the type of appliance discussed; it is not a reconstruction of her unverified specific design. Laboratory and clinical images similarly illustrate applications, not proof of device performance.

Source and reuse practice

Prefer archival or open sources where possible, preserve credits and verify licences before republishing source images. Keep a register of the person, source URL, institution, date and required attribution. The links and source-status labels are research aids; rights and availability may change.

Reading the companion volumes

This edition adopts the Europe/UK booklet's two-column structure, consistent profile headings, compact credit table and navigation. The African cover retains its ivory-and-gold palette and Africa-centred imagery.

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