

Inventions and Innovations by People of African Descent

Patented breakthroughs and achievements beyond patents



Compiled by
Dr. John Terkunor Tetteh

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2026 edition

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.

REFERENCE BOOKLET

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Click a contents entry to go to its section. Numbered references throughout the booklet link to the original sources.

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 the surviving evidence is incomplete, the entry identifies that limitation rather than assigning an unsupported patent.

The profiles distinguish each person's contribution from broader claims about inventing an entire technology.

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 and record	Contribution and significance
01 Thomas L. Jennings African American 1821 Patent US 3306X [1]	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.
02 Henry Blair African American 1834 Documented patent [2]	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.
03 Norbert Rillieux Louisiana-born; African and European ancestry 1846 Patent US 4,879 [3]	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.

Person and record	Contribution and significance
04 Elijah McCoy Canadian-born; African American parentage; worked in the US 1872 Patent US 129,843 [4]	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.
05 Jan Ernst Matzeliger Suriname-born; African and Dutch ancestry; worked in the US 1883 Patent US 274,207 [5]	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.
06 Granville T. Woods African American 1887 Patent US 373,383 [6]	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.

Person and record	Contribution and significance
07 Lewis H. Latimer African American 1882 Patent US 252,386 [7]	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.
08 Alexander Miles African American 1887 Patent US 371,207 [8]	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.

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 and record	Contribution and significance
09 Judy W. Reed African American 23 September 1884 Patent US 305,474 [9]	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.
10 Sarah E. Goode African American 1885 Patent US 322,177 [10]	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.
11 Sarah Boone African American 1892 Patent US 473,653 [11]	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.

Person and record	Contribution and significance
12 Philip B. Downing African American 1891 Patent US 462,093 [12]	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.
13 Garrett A. Morgan African American 1914 and 1923 Signal patent US 1,475,024 [13]	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.
14 Alice H. Parker African American 1919 Patent US 1,325,905 [14]	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.
15 Marjorie Stewart Joyner African American 1928 Patent US 1,693,515 [15]	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.

Person and record	Contribution and significance
16 Marie Van Brittan Brown African American 1969 Co-patent US 3,482,037 [16]	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 system should not be presented as Marie's sole invention or as the invention of television.
17 Mary Beatrice Davidson Kenner African American 1956 Patent US 2,745,406 [17]	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.

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 and record	Contribution and significance
18 Joseph Lee African American 1894 and 1895 US 524,042 and 540,553 [18]	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.
19 Lloyd Augustus Hall African American 1920s–1930s Patented processes [19]	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.

Person and record	Contribution and significance
20 George Washington Carver African American 1900s–1920s Patents and work beyond patents [20]	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.
21 Percy Lavon Julian African American 1935 Published synthesis; later industrial patents [21]	Total synthesis of physostigmine With Josef Píkl, 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.
22 Alice Augusta Ball African American About 1915–1916 Historical chemical method [22]	Injectable chaulmoogra-oil derivatives known as the Ball Method Developed a chemical method involving fatty-acid ethyl esters that made chaulmoogra preparations more suitable for injection in historical 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.

Person and record	Contribution and significance
23 Charles Richard Drew African American 1940–1941 Methods and system development [23]	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 basic plasma methods. Drew’s major achievement was improving and organising reliable systems at scale, including mobile donation arrangements.
24 Frederick McKinley Jones African American Late 1930s onward Patented equipment [24]	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.
25 Patricia Era Bath African American Conceived 1981; patent 1988 Patent US 4,744,360 [25]	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.

CHAPTER 04

Electronics computing and space

Many advances in communications, computing and scientific instrumentation arise through collaboration. These entries distinguish an individual's contribution from the broader technology and acknowledge named collaborators where appropriate.

Person and record	Contribution and significance
26 James E. West African American Patent granted 1964 Co-patent US 3,118,022 [26] [27]	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.
27 Otis F. Boykin African American Patents from 1959 Patent US 2,891,227 [28]	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.
28 Mark E. Dean African American 1985 Co-patent US 4,528,626 [29] [30]	Microcomputer bus-control architecture With Dennis Moeller, co-developed an architecture supporting communication with peripheral processing devices. Dean's wider IBM work 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.

Person and record	Contribution and significance
29 Marian Rogers Croak African American Career from the 1980s Representative US 7,599,359 [31]	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.
30 Valerie L. Thomas African American 1980 Patented optical system [32] [33]	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.
31 Gerald “Jerry” Lawson African American Launched 1976 Team product development [34]	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.
32 Lonnie G. Johnson African American 1986 Patent US 4,591,071 [35] [36]	Pressurised water gun underlying the Super Soaker Developed pressure-based water-gun technology commercialised as the Super Soaker. The patent documents the underlying toy design. Johnson’s wider engineering career also includes work on energy systems and spacecraft.

Person and record	Contribution and significance
33 Emmett W. Chappelle African American 1960s onward Patent US 3,423,290 [37]	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.
34 George R. Carruthers African American Apollo 16 deployment 1972 Scientific instrument development [38]	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.

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 and record	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]	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.
36 Sossina M. Haile Ethiopian-born American scientist Landmark paper 2001 Published team research [41] [42]	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.

Person and record	Contribution and significance
37 Samuel Achilefu Nigerian-born; worked in the US Used in surgery in 2014 Team imaging-system development [43]	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.
38 Arthur Zang Cameroonian Documented 2014; Africa Prize 2016 Medical product development [44] [45]	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.
39 Askwar Hilonga Tanzanian Africa Prize 2015 Team process and product development [45]	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.

Person and record	Contribution and significance
40 Ludwick Marishane South African Recognised by 2011 Product formulation and development [46]	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.

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 and record	Contribution and significance
41 Lewis Temple African American 1848 Documented unpatented invention [47] [48]	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.
42 Benjamin Banneker African American 1753 Historical engineering achievement [49]	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 sole authorship of Washington's city plan.

Person and record	Contribution and significance
43 Ellen F. Eglin African American Reported sale in 1888 Reported invention; patent attribution unresolved [50]	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 another inventor's patent to her or reconstructing an exact mechanism without evidence would go beyond the record.
44 Madam C. J. Walker African American Early 1900s Product and business innovation [51]	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.
45 Annie Turnbo Malone African American Early 1900s Product and business innovation [51]	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.

Person and record	Contribution and significance
46 William Kamkwamba Malawian Early 2000s Practical adaptation; documentary evidence [52]	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 account and Dartmouth's history; no patent claim is needed to recognise it.
47 Richard Turere Kenyan Maasai innovator Publicly presented 2013 Documented invention; no patent claim here [53]	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.
48 Katherine G. Johnson African American 1960 report; 1961–1962 missions Published mathematics; not a device invention [54]	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.

REFERENCE BOOKLET

Giving precise credit

Accurate wording strengthens recognition. The following examples show how a familiar broad claim can be replaced with a contribution that the cited record supports.

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]

Common broad claim	More accurate wording
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's recognised achievements lie in 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]

REFERENCE BOOKLET

Research notes

How the entries were selected

The catalogue prioritises contributions supported by patents, archival or museum records, universities, scientific publications and first-hand 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. The US Patent and Trademark Office describes Henry Baker's efforts to assemble evidence of 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 so that their significance can be understood on their own terms.

Scope of the social media reference

The TikTok video that prompted the research could not be independently reviewed for this compilation. This booklet is an independent, source-based selection; it does not identify any entry as a verified claim made in that video.

[Original TikTok reference](#)

REFERENCE BOOKLET

Sources and further reading

Numbers correspond to the references in the tables. Click a source title to open the original record. Patent links lead to full patent texts and bibliographic details hosted by Google Patents.

- [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
- [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
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- [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
- [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 — Film based on William Kamkwamba's life

[53] TED — Richard Turere and Lion Lights

[54] NASA — Katherine Johnson biography

[55] USPTO — Found on Baker's list

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PORTRAIT RESEARCH UPDATE

Research date: 30 September 2026

Adding visual provenance without losing precision

The original 2026 reference booklet is retained unchanged. This appended research section records portrait-source research for all 48 profiles so that future illustrated editions can use images with clearer provenance, licensing and attribution. Priority was given to public-domain or openly licensed archival material, government sources, museums, universities and recognised institutional profiles.

A

Tier A — archival/open source

Public-domain, government or clearly open-licensed portrait source located.

B

Tier B — institutional source

Portrait/profile located, but image-specific reuse terms should be checked before republication.

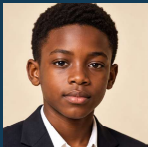
C

Tier C — no verified portrait

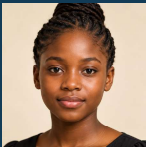
Do not present an invented likeness as authentic; use a clearly labelled placeholder or patent/object image.

IMPORTANT IMAGE-INTEGRITY NOTE

Where no verified portrait was located, the booklet should not imply that a generated face is the historical person. The generic youth portraits shown here are illustrative placeholders only, following the requested fallback approach, and must always be labelled as such.



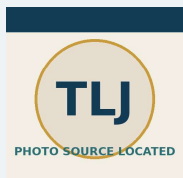
illustrative



illustrative

PORTRAIT SOURCE RESEARCH

Profiles 01-06



01 Thomas L. Jennings

Dry-scouring clothes-cleaning process

Wikimedia Commons — attributed 19th-century portrait

ARCHIVAL / OPEN SOURCE



OPEN SOURCE



02 Henry Blair

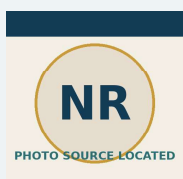
Mechanical seed planter

Wikimedia Commons category / patent record

NO VERIFIED PORTRAIT



OPEN SOURCE



03 Norbert Rillieux

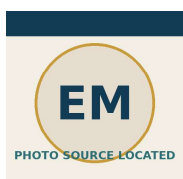
Multiple-effect evaporation for sugar refining

Wikimedia Commons

ARCHIVAL / OPEN SOURCE



OPEN SOURCE



04 Elijah McCoy

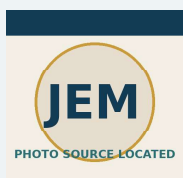
Automatic engine lubricator

Wikimedia Commons / The Henry Ford

ARCHIVAL / OPEN SOURCE



OPEN SOURCE



05 Jan Ernst Matzeliger

Automatic shoe-lasting machine

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ARCHIVAL / OPEN SOURCE



OPEN SOURCE



06 Granville T. Woods

Railway telegraph systems

Wikimedia Commons

ARCHIVAL / OPEN SOURCE



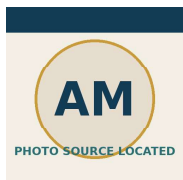
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PORTRAIT SOURCE RESEARCH

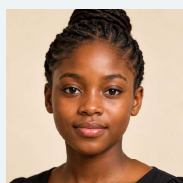
Profiles 07-12

**07 Lewis H. Latimer****Improved carbon-filament manufacture**

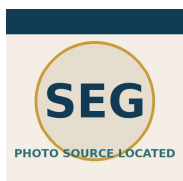
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ARCHIVAL / OPEN SOURCE**OPEN SOURCE****08 Alexander Miles****Automatic elevator-door mechanism**

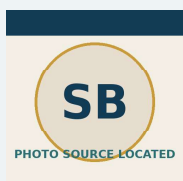
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ARCHIVAL / OPEN SOURCE**OPEN SOURCE****09 Judy W. Reed****Improved dough kneader and roller**

Patent record / historical research

NO VERIFIED PORTRAIT**OPEN SOURCE****10 Sarah E. Goode****Folding cabinet bed**

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INSTITUTIONAL SOURCE**OPEN SOURCE****11 Sarah Boone****Improved ironing board**

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INSTITUTIONAL SOURCE**OPEN SOURCE****12 Philip B. Downing****Improved street letter box**

HistoCards / historical photo references

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Profiles 13-18



13 Garrett A. Morgan

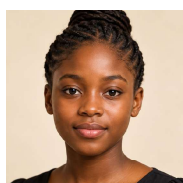
Safety hood and three-position traffic signal

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14 Alice H. Parker

Gas-fired heating-furnace design

Patent record / Wikimedia patent drawings

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15 Marjorie Stewart Joyner

Permanent-wave machine

National Inventors Hall of Fame

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16 Marie Van Brittan Brown

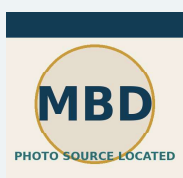
Home security using television surveillance

Historical / educational sources

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17 Mary Beatrice Davidson Kenner

Sanitary-belt design

Science Museum Group / Lemelson-MIT

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18 Joseph Lee

Dough-kneading and bread-crumbling machines

National Inventors Hall of Fame / historical sources

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Profiles 19–24



19 Lloyd Augustus Hall

Meat-curing and preservation processes

Historical photo referenced by Howard University archive

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20 George Washington Carver

Agricultural product development and practical chemistry

Library of Congress / Wikimedia Commons

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21 Percy Lavon Julian

Total synthesis of physostigmine

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22 Alice Augusta Ball

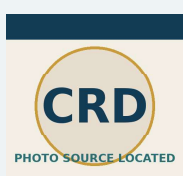
Injectable chaulmoogra-oil derivatives — Ball Method

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23 Charles Richard Drew

Large-scale plasma processing and banking

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24 Frederick McKinley Jones

Practical mobile refrigeration

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Profiles 25–30

**25 Patricia Era Bath****Laserphaco cataract-removal device and technique**

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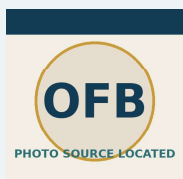
**26 James E. West****Foil-electret microphone**

National Inventors Hall of Fame

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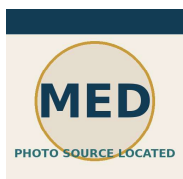
**27 Otis F. Boykin****Improved electrical resistors**

Wikimedia Commons / U.S. Department of Energy

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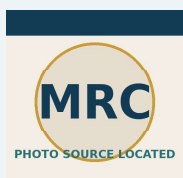
**28 Mark E. Dean****Microcomputer bus-control architecture**

IBM history / National Inventors Hall of Fame

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**29 Marian Rogers Croak****Voice over Internet Protocol technologies**

Google / NCWIT

INSTITUTIONAL SOURCE



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**30 Valerie L. Thomas****Illusion transmitter**

NASA

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Profiles 31–36



31 Gerald “Jerry” Lawson

Fairchild Channel F cartridge-based games console

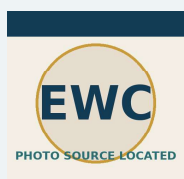
The Henry Ford / The Strong

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32 Lonnie G. Johnson

Pressurised water gun underlying the Super Soaker

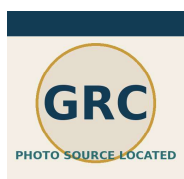
USPTO / National Inventors Hall of Fame

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33 Emmett W. Chappelle

Bioluminescence-based detection methods

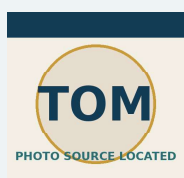
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34 George R. Carruthers

Far-ultraviolet camera and spectrograph

NASA / U.S. Naval Research Laboratory / Wikimedia Commons

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35 Thomas Owusu Mensah

Optical-fibre manufacturing improvements

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36 Sossina M. Haile

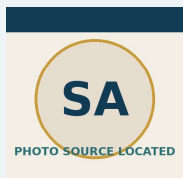
Solid-acid fuel cells

Northwestern University

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Profiles 37–42



37 Samuel Achilefu
Wearable cancer-imaging goggles
UT Southwestern / Washington University

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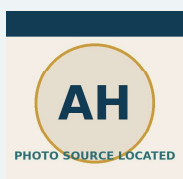


38 Arthur Zang
Cardiopad
Royal Academy of Engineering — Africa Prize

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39 Askwar Hilonga
Nanofilter water-treatment system
Royal Academy of Engineering — Africa Prize

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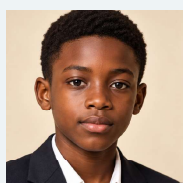


40 Ludwick Marishane
DryBath body-cleansing product
University of Cape Town

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41 Lewis Temple
Improved toggle harpoon
U.S. National Park Service

NO VERIFIED PORTRAIT



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42 Benjamin Banneker
Construction of a wooden clock
Historical sources / Wikimedia Commons

NO VERIFIED PORTRAIT



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Profiles 43–48

**43 Ellen F. Eglin****Clothes-wringer improvement**

Historical research / patent-related records

NO VERIFIED PORTRAIT

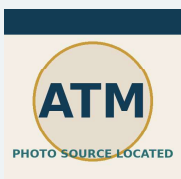
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**44 Madam C. J. Walker****Hair-care products and the Walker business system**

Wikimedia Commons / Smithsonian-related holdings

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**45 Annie Turnbo Malone****Poro hair-care enterprise and professional training**

Smithsonian NMAAHC / Wikimedia Commons

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**46 William Kamkwamba****Locally built wind-powered electricity system**

Dartmouth / TED

INSTITUTIONAL SOURCE

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**47 Richard Turere****Lion Lights livestock-protection system**

TED

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**48 Katherine G. Johnson****Orbital-flight calculation methods and trajectory analysis**

NASA / Wikimedia Commons

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Recommended workflow for a publication-ready illustrated edition

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WHAT THIS UPDATE ADDS

- A source-quality tier for every one of the 48 profiles.
- Clickable portrait-source links and QR codes.
- Explicit identification of cases where no verified portrait was located.
- A safer fallback rule for generated imagery: placeholders are labelled and never represented as the historical person.
- The original 29-page booklet remains intact at the front of this edition.

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