

**THE AWARDS OF THE
INTERNATIONAL JURIES,
CONFIRMED AND ISSUED BY
THE JURY COMMISSIONERS**

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The awards of the international juries, confirmed and issued by the jury Commissioners by
Various

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VARIOUS

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INTERNATIONAL JURIES,
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International Inventions Exhibition,

LONDON, 1885.

THE AWARDS

OF THE

INTERNATIONAL JURIES,

CONFIRMED AND ISSUED BY

THE JURY COMMISSIONERS.

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1885.

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Jury Commission.

(Appointed by H.R.H. the Prince of Wales, K.G., President of the Exhibition.)

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F.R.S.

JOHN ROBINSON.

Secretary.—H. TRUMAN WOOD, M.A.

LIST OF JURORS.

JURY A.

GROUP 1.—Agriculture, Horticulture, and Arboriculture.

Lord THURLOW, *Chairman*.
CLARE SEWELL READ, M.P., *Vice-Chairman*.
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J. Ruston, M.P.
Prof. J. P. Sheldon.
Sir J. H. Thorold, Bart.
Jacob Wilson.

JURY B.

GROUP 2.—Mining and Metallurgy.

GROUP 16.—Fuel, Furnaces, &c.
Sir BERNARD SAMUELSON, Bart., M.P., *Chairman*.
THOMAS JOHN BEWICK, *Vice-Chairman*.
Sir H. HUESKY VIVIAN, Bart., M.P., *Vice-Chairman*.
B. H. Brough, *Reporter*.
Emerson Balbridge.
Alfred Baldwin.
Edward Barlow.
Hilary Baerman.
T. Foster Brown.
C. Le Neve Foster, D.Sc.
W. Galloway.
W. Thomas Lewis.
E. P. Martin.
George Matthey, F.R.S.
J. Arthur Phillips, F.R.S.
E. Windsor Richards.
Thomas Sopwith.

JURY C.

GROUP 3.—Engineering Construction and Architecture.

GROUP 4.—Prime Movers and Means of Distributing their Power.

GROUP 5.—Railway Plant.

W. H. BARLOW, F.R.S., *Chairman*,
Captain DOUGLAS GALTON, C.B.,
F.R.S., *Vice-Chairman*.
Arthur J. Atchison, M.A., *Reporter*.
Benjamin Baker.
David Banderall.
Lord Sackville Cecil.

Ewan Christian.
Edward Alfred Cowper.
W. Lyster Holt.
J. Clarke Hawkeshaw, M.A.
General Hutchinson.
General Hyde, R.E.
John Innes.
Major Martindale, R.E.
W. P. Marshall.
William Parker.
John Ramsbottom.
Colonel Rich.
E. C. Robins.
Captain Eyre M. Shaw, C.B.
Edward Woods.

JURY D.

GROUP 10.—Machine Tools and Machinery.

GROUP 11.—Hydraulic Machines, Presses, Machines for Raising Heavy Weights, Weighing, &c.

GROUP 12.—Elements of Machines.

THOMAS HAWKLEY, F.R.S., *Chairman*.
E. GARRETT, M.P., *Vice-Chairman*.
Stephen Holman, *Vice-Chairman*.
Joseph Tomlinson, } *Reporters*.
Prof. Cawthorne }
Unwin.
Stewart Garnett.
T. M. Goodeve.
Charles Hawksley.
John Hick.
R. A. Hill.
A. B. Kemps, F.R.S.
John George Mair.
F. C. Marshall.
Captain Eyre M. Shaw, C.B.
Henry Shield.
Benjamin Walker.

JURY E.

GROUP 6.—Common Road Carriages, &c.

Lord ARTHUR SOMERSET, *Chairman*.
Major-Gen. the Hon. W. FRILDS, *Vice-Chairman*.
C. V. Boys, } *Reporters*.
V. Kesterson, }
Viscount Bury.
Rev. W. d'A. Crofton.
Hon. Ion Keith Falconer.
Captain John Fenn.
John Macgregor.
Charles Morley.

G. Newson.
G. Palmer, M.P.
Robert Todd.
J. S. Whatton.
C. Lea Wilson.

JURY F.

GROUP 7.—Naval Architecture.

Earl of RAYNESWORTH, *Chairman*.
W. FRANKO, *Vice-Chairman*.
George Holmes, *Reporter*.
W. Boyd.
James Dunn.
Prof. Francis Elgar, L.L.D., F.R.S.E.
M. Berriet Fontaine.
Dixon Kemp.
Capt. Linden.
G. Fosbery Lyster.
Benjamin Martell.
Prof. Osborne Reynolds, F.R.S.
Richard Sennett.
John I. Thornycroft.
Philip Watts.

JURY G.

GROUP 8.—Manufacture of Textile Fabrics.

GROUP 15.—Clothing.

HENRY LEE, M.P., *Chairman*.
S. R. PLATT, *Vice-Chairman*.
Swire Smith, *Reporter*.
F. W. Ashton.
Theo. Aston, Q.C.
James Carver.
Herbert A. Foster.
George W. Grosvenor.
Ferdinand Râth.
T. Martin Southwell.

JURY H.

GROUP 13.—Electricity.

(Class 151, Group 28, "Electrical Appliances" will also be referred to this Jury.)

Prof. W. GUYLLS ADAMS, F.R.S., *Chairman*.
Col. Peeling, R.E., *Vice-Chairman*.
Prof. George Forbes, M.A., *Reporter*.
Capt. Abney, R.R., F.R.S.
Prof. W. E. Ayrton, F.R.S.
Viscount Bury.
Conrad W. Cooke.
E. C. Cracknell.

Dr. J. Hopkinson.
Prof. D. R. Hughes.
Prof. Oliver Lodge, D.Sc.
W. H. Massey.
J. Fletcher Moulton, F.R.S.
C. E. Spagnoletti.

JURY J.

GROUP 14.—*Apparatus, Processes, and Appliances connected with Applied Chemistry and Physics.*

GROUP 15.—*Gas and other Alloys and Stimulants.*

GROUP 17.—*Food, Cookery and Stimulants.*

GROUP 20.—*Philosophical Instruments and Apparatus (with the exception of Class 151, Group 24, "Electrical Apparatus").*

Prof. W. OBLING, F.R.S., *Chairman.*
Prof. GUTHRIE, *Vice-Chairman.*
Boverton Redwood, F.C.S., *Reporter.*
W. Fractor Baker.
H. J. Chadwy.
W. H. Christie, M.A., F.R.S.
W. J. Dibdin.
Harold Dixon, M.A.
J. Emerman Dowson.
Sergeon-Major Theodore Duka, M.D.
Prof. G. Carey Foster, F.R.S.
J. Norman Lockyer, F.R.S.
Dr. L. Loewenherz.
H. McLeod, F.R.S.
W. H. Perkin, Ph.D., F.R.S.
Sir H. E. Roscoe, F.R.S.
C. Meynott Tidy.
Walter Weldon, F.R.S.

JURY K.

GROUP 19.—*Jewellery.*

GROUP 22.—*Furniture and Accessories; Fancy Goods.*

GROUP 23.—*Pottery and Glass.*

GROUP 24.—*Cutlery, Ironmongery, &c.*

Lord ALFRED CHURCHILL, *Chairman.*
Sir GEORGE BRIDWOOD, *Vice-Chairman.*
E. Macropy *Reporter.*
R. W. Bliss.
E. Brudenell Carter.
Prof. A. H. Church, M.A.
Colonel Shadwell Clarke.
Alfred Copeland.
Henry Harrison.
George Lambert F.S.A.
Leopold Pam.
Alfred Phillips.
F. B. Thomas.
Thomas Wardle.
Godfrey Wedgwood.
W. Woodall, M.P.

JURY L.

GROUP 20.—*Leather, &c.*

GROUP 21.—*Rubber and Gutta-percha, &c.*

W. L. Jackson, M.P., *Chairman.*
P. B. Cow, *Vice-Chairman.*
W. Y. Dent, *Reporter.*
Lieut.-Col. Bevington.
T. E. Blair.
T. Bolas.
Snarks Evans.
Benjamin Nickels.
Thomas Palmer, B.Sc.

JURY M.

GROUP 8.—*Aeronautics.*

GROUP 25.—*Fire-arms; Military Weapons and Equipments; Explosives.*

Colonel Sir CHARLES NUGENT, R.E., K.C.B., *Chairman.*
Admiral ROYS, *Vice-Chairman.*
Captain W. H. Hall, R.N., *Reporter.*
Colonel H. Arbuthnot, R.A.
Lieut.-Colonel Bond.
Sir WILLIAM CRESSMAN, R.E., K.C.M.G.
Earl De Grey.
A. Dupré, M.D., F.R.S.
Lieut.-Colonel Fairfax Ellis, R.A.
Commander Gallwey, R.N.
Captain Linden.
Colonel Majendie, C.B.
Lieut.-Colonel W. H. Noble, R.A.
Stewart Pixley.
Major M. T. Sale, R.E.
Major Templar.
Baron Von Linden.

JURY N.

GROUP 26.—*Paper, Printing, Bookbinding, Stationery, &c.*

C. M. KENNEDY, C.B., *Chairman.*
Hugo MÜLLER, Ph.D., F.R.S., *Vice-Chairman.*
J. L. Clifford-Smith, *Reporter.*
W. Blades.
Richard Clay.
Edward Alfred Cowper.
J. S. Hodson.
Hubert Cradock Nichols.
Henry Spicer.

JURY O.

GROUP 27.—*Clocks, Watches, and other Time-keepers.*

J. NORMAN LOCKYER, F.R.S., *Chairman.*
G. S. CRAWFORD, F.R.A.S., *Vice-Chairman.*
Edward Rigg, M.A., *Reporter.*
Henry Dean Gardner.
D. Glasgow.

Prof. T. A. Hearnson, R.N.
Thomas Mercer.
J. Rothenam.
A. Stroth.
J. Trippin.

JURY P.

GROUP 29.—*Photography.*

WARREN DE LA RUE, D.C.L., F.R.S., *Chairman.*
Captain ANNET, R.E., F.R.S., *Vice-Chairman.*
Colonel Stuart Wortley, *Reporter.*
T. Bolas.
W. B. Bolton.
Hugh W. Diamond, M.D., F.S.A.
W. F. Donkin.
John Spiller, F.C.S.

JURY Q.

GROUP 30.—*Educational Apparatus.*

GROUP 31.—*Toys, Sports, &c.*

Colonel ESTERLE, R.E., *Chairman.*
J. G. FERRIS, *Vice-Chairman.*
Philip Magnus, *Reporter.*
Major Amstruther, R.A.
G. C. T. Bartley.
T. William Cole.
John Marshall.
Major G. S. Sewell-Gana.

JURY R.

GROUP 32.—*Instruments and Appliances constructed or in use since 1800.*

GROUP 34.—*Music Engraving and Printing.*

H.R.H. the Duke of ECKENBACH, K.G., *Chairman.*
Earl of LATHOM, *Vice-Chairman.*
A. C. Köhler.
Dr. William Pole, F.R.S., *Reporters.*
George Curtis Price,
W. H. Stone, M.D.,
E. H. Purkin.
Luigi Arditi.
R. H. M. Bonanquet.
J. Frederic Bridge, Mus. Doc.
Alfred Gibson.
Thomas Harper.
M. Hawkins.
Prof. George Horton.
William Huggins, D.C.L., F.R.S.
J. A. Fuller Maitland.
August Manns.
Dr. Martin.
Samuel Miller.
Walter Parratt.
Ernst Pauet.
E. J. Payne.
Kugeno Peruzzi.
H. W. Peterick.
W. S. Rockstro.
C. V. Stanford, M.A.
Franklin Taylor.

CLASSIFICATION.

DIVISION I.—APPARATUS, APPLIANCES, PROCESSES, AND PRODUCTS, INVENTED OR BROUGHT INTO USE SINCE 1862.

Group I.—AGRICULTURE, HORTICULTURE AND ARBORICULTURE.

(For land drainage, reclamation, &c., see Group iii.; for agricultural engines, see Group iv.; for manure, see Group xiv.; for milling machinery, see Group xvii.)

- CLASS 1. FIELD IMPLEMENTS.—Ploughs, drain-ploughs, cultivators, steam-diggers, harrows, drills, haymakers, horse-hoes, rakes, reapers, mowers, binders, anchors and rope porters, wagons, wagon-harness.
- „ 2. BARN AND FARM-YARD IMPLEMENTS.—Threshing machines, screens, winnowers, corn-cleaning machines, hay and straw elevators, hay and straw and fresh fodder compressors, turnip-cutters, chaff-cutters, grist mills, horse-gear, crop dryers.
- „ 3. DAIRY AND POULTRY-FARM APPLIANCES.—Milking appliances, cream separators, churns, cheese-making apparatus, apparatus for manufacturing butterine, incubators.
- „ 4. AGRICULTURAL CONSTRUCTION.—Models, plans and designs for farm buildings, oat houses, siloes, rickstands, &c.
- „ 5. CATTLE FOOD.—Materials, processes, apparatus; seed mills, cake crushers; boilers, steamers and cooking apparatus; feeding appliances.
- CLASS 6. HORTICULTURAL APPARATUS.—Hot-houses, frames, greenhouses, orchard houses, graperies, boiler and heating apparatus, lawn mowers, watering apparatus, tools and implements, pots and plant boxes, garden wire-work, chairs, &c., plant labels.
- „ 7. ARBORICULTURE.—Apparatus, &c., used in forestry; methods and materials for the preservation from decay of trees and timber.

Group II.—MINING AND METALLURGY.

(For stone-working machinery and testing machines, see Group x.; for metal-working machinery, see Group x.; for slate sawing and dressing machines, see also Group x.; for electrolytic methods of extracting, &c., metals, see Group xiii.; for furnaces in general, see Group xvi.; for manufacture of fuel, see also Group xvi.; for explosives, see also Group xxv.; for mine-surveying apparatus, see also Group xxviii.)

CLASS 8. MACHINERY AND APPLIANCES USED IN MINES AND QUARRIES.—

Prospecting, searching, boring, shaft sinking, exploring, working, hauling, pumping, winding, hoisting; man engines, safety catches, safety hooks, hydraulic mining; tools, drills, cutters, getters, breakers, air compressors; blasting, substitutes for explosives. Ventilating, lighting. Aids to respiration in mines. Life-saving appliances. Washing and dressing coal and other minerals, crushers, pulverisers, disintegrators, stamps, screens, riddles, separators, classifiers, jiggers, buddles, precipitators, sawing-machines. Utilisation of waste.

9. **PRODUCTION AND MANUFACTURE OF IRON AND STEEL.**—Coke ovens, blast and other furnaces; Bessemer plant, Siemens plant, other processes for making iron and steel; blast engines; hot-blast stoves; steam and other hammers; rolling machines, hydraulic and other forging machines, squeezers and other shingling apparatus; production and use of malleable cast iron; wire-making apparatus; manufacture of tin plate, utilisation of gases and of slag; alloys and artificial compounds of iron with non-metallic elements.
10. **FORGING AND FOUNDRY WORK.**—Cupolas, air furnaces, pot furnaces; moulding machines, plate-moulding; forges, forging machines; blowers, bellows, fans.
11. **METALLURGY OF METALS OTHER THAN IRON, WITH THE EXCEPTION OF THE PRECIOUS METALS. ALLOYS.**—Furnaces and appliances used in the dry and wet methods of extracting and purifying copper; extraction of lead; metallurgy of zinc, tin, nickel, cobalt, bismuth, antimony, arsenic, mercury, aluminium; manufacture of sheet lead, lead pipe, Muntz's metal, sheet zinc, copper and brass tubes; bronzes, German silver and other nickel alloys; wires of copper and its alloys.
12. **METALLURGY OF THE PRECIOUS METALS, GOLD, SILVER AND PLATINUM.**—Furnaces and appliances used in the dry and wet methods of extracting the precious metals; desilverisation of lead; amalgamation in all its forms, refining gold and silver; purification, melting and working of platinum and its alloys.

Group III.—ENGINEERING CONSTRUCTION AND ARCHITECTURE.

(For railway plant, see Group v.; for launching ships, see Group vii.; for surveying instruments, see Group xxviii.)

- CLASS 13. **ROADS.**—Methods and materials for constructing and paving roads; cleansing roads and pavements; road-sweeping machines; rollers; apparatus for the removal of mud, snow, &c.; water-carts and other means of watering.
14. **RAILWAYS AND TRAMWAYS.**—Construction; excavators and appliances used for earth-work and tunnelling. Permanent way; rails, chairs sleepers.
15. **BRIDGES AND VIADUCTS.**—Models, plans, and designs for arched, girder, suspension, trestle, and other bridges; apparatus used in construction.

- CLASS 16. DOCKS AND HARBOURS.**—Models, plans, and designs for docks, harbours, piers, breakwaters, &c.; submarine constructions; diving apparatus; dredging machines; pile-drivers, screw piles; cofferdams; graving docks, "patent" slips, caissons, pontoons, floating docks, hydraulic apparatus for working dock-gates, &c., gridirons. Buoys.
- " 17. **LIGHTHOUSES.**—Methods of construction; appliances used in light houses and in lightships, fixed and flashing light apparatus, lamps, sound signalling apparatus.
- " 18. **RIVERS AND CANALS.**—Conservation and Improvement of rivers; construction of canals; locks, lifts and inclines, weirs.
- " 19. **WATER SUPPLY AND SEWERAGE.**—Methods of collecting, pumping, storing, filtering, and distributing water; appliances for detecting and preventing waste of water, water-meters; water fittings, filters; sewers, sewage disposal and utilisation.
- " 20. **RECLAMATION, IRRIGATION AND DRAINAGE OF LAND.**—Drainage (natural and artificial) of low-lying districts; embanking and warping land; irrigation works.
- " 21. **TESTING APPARATUS.**—Apparatus and instruments used in testing iron, stone, brick, concrete, cement, &c.
- " 22. **MILITARY ENGINEERING AND FORTIFICATION.**—Military topography.
- " 23. **MATERIALS USED IN BUILDING.**—Bricks and tiles, machines for making them; concrete, artificial stone, cement, materials and appliances used in their production; asphalt; roofing felt, and other roofing materials; columns, girders, and other application of metal in building; applications of terra-cotta to buildings; preservative and fire-resisting materials, paints, &c., for application to stone, wood, iron, &c.; methods of applying the same.
- " 24. **BUILDING CONSTRUCTION.**—Models and plans showing methods of construction; non-combustible constructions; labour saving and other machines and appliances used in building, scaffolds, elevators fittings and appliances used in buildings, shutters, blinds, lifts, bells, speaking-tubes, &c.
- " 25. **HEATING, VENTILATION, HOUSE-DRAINAGE, &c.**—Sanitary appliances; ventilators; cowls for chimneys, chimney-sweeping apparatus; apparatus for heating by steam, water, air, &c.; means of cooling air.

Group IV.—PRIME MOVERS, AND MEANS OF DISTRIBUTING THEIR POWER.

(For distribution of power by water, see also Group xi.; by electricity, see Group xiii.)

- CLASS 26. STEAM-ENGINES AND BOILERS.**—Stationary, portable, marine, locomotive; fireless locomotives; methods and means of preventing corrosion and incrustation; methods and appliances for preventing explosions, and for testing boilers; firegrates, fire-feeders, smoke-consuming appliances; valves and valve gear, steam joints, governors, injectors, pumps; bearings, lubricators, anti-friction metals; indicators, gauges, manometers, tachometers, dynamometers.