

## 4 Illumination by fuels, burners in general

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- 4a **Lanterns, pit lamps, candlesticks, torches, lamp accessories, holders for illuminating bodies**
  - 4b **Illumination, also if independent of the light source**
  - 4c **Gasholders, pressure regulators within the pipe net and consumption regulators for lighting and cooking purposes, circulation regulators for pressure gas installations, conduction and distribution of gaseous fuels, mixing devices for gas and air etc., in gas works, installations for compressed gas manufacture**
  - 4d **Ignition and extinction devices, also electric except switch constructions**
  - 4e **Catalytic gas auto-igniters**
  - 4f **Incandescent bodies**
  - 4g **Burners; carburettors for liquid fuels, if combined with a burner; arrangement of the burner in the lamp; connection of the burner with other lamp parts so as to increase the effect of the burner**
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### 4a **Lanterns, pit lamps, candlesticks** (Christmas tree candlesticks 34l), **torches, lamp accessories** (burners 4g), **holders for illuminating bodies**

#### **Lamp reservoirs**

- 4a-1 Internal construction of lamp reservoirs
- 4a-2 Filling devices and oil gauges on lamp reservoirs (on kerosene and methylated spirit cans 34l-20; liquid level indicators 42e-30; drawing off incendiary liquids 64c-44/01, 81e-139)
- 4a-3 Joining of lamp reservoirs with other lamp parts

#### **Wicks and accessories**

- 4a-4 Fabric wicks
- 4a-5 Mineral wicks
- 4a-6 Combined fabric and mineral wicks
- 4a-7 Wick trimmers

#### **Fuel feed in lamps**

- 4a-8 by hydrostatic or weight pressure
- 4a-9 by compressed gases
- 4a-10 Regulation of fuel feed in lamps by floats, inverted fonts or Mariotte flasks, etc. (in vapour burners 4g-27)

#### **Lamp chimneys, globes and accessories, regulation and feed of outer combustible air only, by means of fixtures on the lamp accessories** (4g-47; 4g-54)

- 4a-11 Lamp chimneys and glasses in general
- 4a-12 Composite lamp chimneys
- 4a-13 Preliminary heating chimneys for lamps
- 4a-14 Lamp globes
- 4a-15 Smoke bells for lamps
- 4a-16 Draught regulators and wind protectors for lamps

**Fastening and securing lamp chimneys, globes and incandescent bodies**

- 4a-17 Lamp chimney supports and regulation and feed of outer combustible air connected therewith (4g-47; 4g-54)
- 4a-18 Lamp globe supports and exterior lamp housings and regulation and feed of outer combustible air connected therewith (4b; 4g-47; 4g-54)
- 4a-19 Hoisting devices for the chimney gallery of lamps
- 4a-20 Protecting devices for incandescent illuminating bodies
- 4a-21 Incandescent mantle fastenings when fitted to the lamps (4f-4)
- 4a-22 Shock-absorbing devices for lamp burners
- 4a-23 Shock-absorbing devices for lamps

**Holders and suspension devices for lamps** (for electrical illumination 21f-57 – 21f-61)

- 4a-24 Fastening and adjusting devices for stand lamps
- 4a-25 Holders, fastening and adjusting devices for hanging lamps exclusive of hoisting mechanisms
- 4a-26 Wall brackets for lamps
- 4a-27 Friction hoists, especially telescoping hoists for lamps
- 4a-28 Counterweight hoists for lamps
- 4a-29 Spring hoists for lamps
- 4a-30 Lever hoists for lamps
- 4a-31 Rope hoists for lamps

**Candlesticks, e.g. candelabra, and fittings; night lights, torches, lanterns** (lanterns for photo dark rooms 57c-14/02)

- 4a-32 Candlesticks and candle holders, also for mines
- 4a-33 Candle sockets
- 4a-34 Drip catchers and shade holders for candles
- 4a-35 Night lights, small lamps, etc.
- 4a-37 Torches (magnesium lamps 57c-2, 57c-3)
- 4a-38 Lanterns with replaceable light sources
- 4a-39 Carriage lanterns
- 4a-40 Bicycle lamps
- 4a-41 Travelling and pocket lanterns
- 4a-42 Means for lifting and fastening the chimney in storm and hand lanterns
- 4a-43 Air feed in hurricane and hand lanterns
- 4a-44 Parts of hurricane and hand lanterns
- 4a-45 Windproof torches, baking oven and firemen's lanterns (oven illumination 2a-8)
- 4a-46 Street lamps
- 4a-47 Signal lamps and dark lanterns (for switches, barriers and signals 20i-14/01, signalling devices on lanterns 74d-9)
- 4a-48 Head lights for locomotives, ships and carriage so far as the general construction of the lanterns themselves is concerned (20i-24/01)
- 4a-49 Holders and hangers for lanterns (for bicycles 63g-11, for carriages 63a-4, for motor vehicles 63c-62; for rail vehicles 20i-24/01)
- 4a-50 Open miners' lamps
- 4a-51 Parts of miners' lamps, except closures (fire-damp indicators 42l-4)
- 4a-52 Magnetic closures for miners' lamps
- 4a-53 Mechanical closures for miners' lamps

**4b Illumination, also if independent of the light source****Lamp shades**

- 4b-1/01 Material for lamp shades

- 4b-1/02 Manufacture of lamp shades
- 4b-2 Lamp shades with cooling devices
- 4b-3 Lamp shade stands
- 4b-4 Lamp shades, globes and chimneys (4a-14; 4a-18)
- Reflectors** (reflectors for electric arc lamps 21f-21; interior reflectors for electric incandescent lamps 21f-38)
- 4b-5/01 Reflectors in general (4b-11/02)
- 4b-5/02 Processes for the manufacture of reflectors
- 4b-5/03 Hollow-glass reflectors
- 4b-5/04 Reflectors for street lighting elements
- 4b-5/05 Reflectors for bicycle and carriage lamps
- 4b-6 Reflectors with cooling devices (4b-11/02)
- 4b-7 Arrangement of reflectors on the burner, lamp and lanterns
- 4b-8 Adjustable shades and reflectors for lamps and lanterns
- 4b-9/01 Reflectors and lighting fixtures for indirect illumination
- 4b-9/02 Built-in lighting fixtures for interior illumination
- 4b-10 Daylight reflectors, e.g. mirrors before windows
- Searchlights** (4b-21; 21f-9; 21f-10; 21f-21; 21f-38; 21f-61/03; 42h-9; 63c; 74d)
- 4b-11/01 Searchlights of general construction
- 4b-11/02 Searchlight reflectors (4b-5) and cooling devices (4b-6)
- 4b-11/03 Mobile searchlights
- 4b-11/04 Focusing devices
- 4b-11/05 Special optical fixtures
- 4b-11/06 Dimming devices (20i-3)
- 4b-11/07 Adjusting devices (20i-3)
- 4b-11/08 Searchlights with several light sources
- 4b-11/09 Light distribution through the searchlight lens
- 4b-11/10 Glass ring and lens mounting on the searchlight
- 4b-11/11 Rotating searchlights
- 4b-11/12 Searchlights for aeronautical purposes
- 4b-12 Lamp chimneys and globes designed to simultaneously form the lamp shade or reflector mounting
- 4b-14 Hanging and fastening of reflector and shade holders on burners and lamps
- Refractors**
- 4b-15/01 Refracting glass screens with lens effect
- 4b-15/02 Refracting glass screens with prism effect
- 4b-15/03 Fixtures for daylight lighting (artificial)
- 4b-15/04 Light filters for daylight lighting (artificial)
- 4b-16 Prism plates for overhead lighting (ceilings for indirect illumination 37d-33)
- Illuminating devices**
- 4b-17 Self-illuminated, e.g. for phosphorescent, luminescent and radioactive light indicators and signs on miscellaneous articles, e. g. switches, bell-buttons (21c-40/07; 54h-5; on keyholes 68a-81)
- 4b-18/01 Glass screens for coloured light effects (54h-2)
- 4b-18/02 Rotating devices for creating coloured light effects
- 4b-19 Lampions (Chinese lanterns) and illuminating lanterns
- 4b-20 Fountain illumination
- 4b-21 Searchlights for creating coloured light effects (4b-11)
- 4b-23 Show window illumination

- 4b-24/01 Lighting of desks, work spaces, pictures
- 4b-24/02 Piano lighting
- 4b-24/03 Operating table lighting
- 4b-24/04 Lighting of streets, squares, railway tracks, etc.

**4c Gasholders (construction 37f), pressure regulators within the pipe net and consumption regulators for lighting and cooking purposes (gas pressure regulators for gas engines 46c1-1; heating regulators 24c), circulation regulators for pressure gas installations (circulation regulators for gas producers 26a), conduction and distribution of gaseous fuels, mixing devices for gas and air etc. in gas works (gas mixtures 26c), installations for compressed gas manufacture (gas piping in railway carriages 20c-27; in coking furnaces 10a-20; valve, tap and slide valve construction 47g; gas pressure regulators for general use 42q, 47g)**

**Cut-off devices for gas, gas cocks and valves with fittings**

- 4c-1 Gas cocks with stationary plugs
- 4c-2 Multi-way gas cocks
- 4c-3 Devices for regulating the position in gas cocks (4e-9)
- 4c-4 Fine adjustment gas cocks, gas-saving cocks (36b-2)
- 4c-5 Operating devices for gas cocks
- 4c-6 Gas cut-off devices in general (gas valves for coking ovens 10a-12, 10a-19, 10a-20; for gas furnaces 24c-7)
- 4c-7 Cut-off devices held open by gas pressure
- 4c-8 Gas cut-off devices operating upon a cessation of gas pressure or the extinction of the flame
- 4c-9 Devices for locking gas cocks or valves in the open or closed position
- 4c-10 Safety cocks and valves which require the heating of an expanding body to hold the cocks and valves in the open position
- 4c-11 Safety cocks and valves in which a previous heating of an expanding body is not needed to bring about the open position
- 4c-12 Safety taps and valves, reclosing automatically after a certain period unless prevented by the expanding body
- 4c-13 Gas cut-off devices with automatic closing of the conduit, e.g. on removing cooking vessels from the stove, or after an adjustable time, or shifting on repeated opening
- 4c-14 Warning devices on gas lines, indicating devices (remote indicating devices 74b-8)

**Distribution of gas in conduits**

- 4c-15 Couplings for gas pipes, hose joints (in general 47f-3 – 47f-17), safety devices against gas escape in case of accidental hose disconnection
- 4c-16 Installation for purifying gas in pipes
- 4c-17 Gas liquor traps, dust traps for gas mains
- 4c-18 Devices for arresting explosions in gas pipes, check valves; water receivers for welding and cutting torches
- 4c-19 Leak detectors and pressure gauges for gas pipes (general 42k)
- 4c-20 Devices for preventing pressure variations and shocks in gas pipes, thrust regulators, pressure wave transmitters (for remote ignition of gas 4d-9, 4d-10)
- 4c-21 Devices for preventing freezing of gas pipes and for the removal of naphthalene obstructions (for carburetion devices 26c-12)
- 4c-22 Cut-off devices for gas mains

**Gas consumption regulators**

- 4c-23 Hand-adjusted gas consumption regulators, throttling devices for gas pipes
- 4c-24 Automatic gas consumption, with float, balanced, or other valves

- 4c-25 Gas consumption regulators, with control valves, with the float placed before the controlled aperture
- 4c-26 Gas consumption regulators with control valves, in which the float is placed behind the controlled aperture
- Gas pressure regulators** (for coking ovens 10a-20; for internal combustion engines 46c1-1; in general 42q)
- Diaphragm regulators
- 4c-27/01 General
- 4c-27/10 for pressure wave transmission
- 4c-27/20 with safety devices against gas leak from the venting aperture of a leaky diaphragm
- 4c-27/30 with safety devices in case of excessively high or low gas pressure and with other safeties
- 4c-27/40 with control by a controlling flow; also those in which the control flow is influenced by other processes or sizes of measurement, such as thermostats (4d-11; 36e)
- 4c-27/50 with added pressure transmission during rising gas consumption
- 4c-27/60 Diaphragms
- 4c-27/70 Valve and valve seat structure
- 4c-28/01 Miscellaneous kinds of gas pressure regulators
- 4c-28/50 Bell gas-pressure regulators, general, valve structure, bell guides, etc.
- 4c-29 Bell gas-pressure regulators with automatic loading and unloading of the regulator bell during ascent and descent because of varying gas consumption (gas remote ignition 4d-9, 4d-10)
- 4c-30 Bell gas pressure regulators with equalisation of changing initial pressure
- 4c-31 Bell gas-pressure regulator with equalisation of changing initial pressure and automatic loading in case of changed bell position
- 4c-32 Float gas-pressure regulators
- Gas holders** (gas meters 42e-24 – 42e-26)
- 4c-33 Gasholders in general, wet gasholders, charge and discharge of bell, guide of holder bell, sealing means (structural arrangements, external guide framing 37f-3/01, 37f-3/02)
- 4c-34 Portable gasholders (17g-3; 47f-18/01 – 47f-18/50; 47g-47/01 – 47g-47/03; 81c-27)
- 4c-35 Gasholders without liquid seal; disk, bell, high-pressure, bellows gasholders, combined high- and low-pressure holders
- 4c-36 Devices for regulating in-and outflow in gasholders
- 4c-37 Safety devices for gasholders, discharge of excess gas, etc.
- 4c-38 Telescopic gasholders, heating devices for the holder tanks
- Pressure gas producers and gas mixers**
- 4c-39 Pressure gas producers set in operation by the heat of the pilot flame or by electricity
- 4c-40 Pressure gas producers with by-pass circulation regulators for pressure installations (gas circulation regulators 26a-17)
- 4c-41 Pressure gas producers driven by hydro- or reciprocating engines
- 4c-42 Pressure gas producers with water jet blowers
- 4c-43 Pressure gas installations of miscellaneous systems
- 4c-44 Devices for mixing and conveying of gas and air by means of gas meter drums (general 12e-4; for carburetion devices 26c-7)
- 4c-45 Pumps and other conveying devices for the mixture and conveyance of gas and air into the pipe or reservoir, gas-air mixture regulators therefor
- 4c-46 Gas mixture regulators for gaswork installations and gas lines, regulators for gas branch or subsidiary pipes (furnace gas mixture regulators 24c-2; in general 12e-4)

- 4d Ignition and extinction devices, also electric except switch constructions** (switches 21c, catalytic gas auto-igniters and their manufacture 4e)
- Fitting of catalytic gas auto-igniters on gas lamps, gas cookers and ranges**
- 4d-1 Fitting catalytic gas auto-igniters on the burner
  - 4d-2 Fitting catalytic gas auto-igniters on the chimney
  - 4d-3 Fitting catalytic gas auto-igniters on poles and other mountings
- Igniting devices with friction and impact effect**
- 4d-4/01 Igniting devices with friction and impact effect apart from pyrophoric igniting devices
  - 4d-4/10 Portable pyrophoric igniting devices
  - 4d-4/20 Pyrophoric igniting devices, especially on gas lamps, also combined with the gas cock (pyrophoric igniting devices, with gasoline container 44b-44 – 44b-51; igniting devices for flash lamps 57c-2, 57c-3)
  - 4d-4/30 Pyrophoric igniting devices on gas cookers and ranges, also in connection with the gas cock
  - 4d-5 Portable gas igniters with liquid containers
- Pilot lights and their structure**
- 4d-6 Pilot lights for upright illuminating burners
  - 4d-7/01 pilot lights for inverted burners
  - 4d-7/10 pilot lights for gas cookers and ranges also climbing flames and flashback lines
  - 4d-8 Gas ignition cocks with pilot flame (small adjustment cocks 4c-4)
- Remote automatic gas ignition and extinction**
- 4d-9 Gas ignition and extinction devices functioning by variability of line pressure without cut-off liquid (pressure wave transmitters 4c-20); pneumatic and hydraulic tele-adjusters for burner closures
  - 4d-10 Gas ignition and extinction devices with fluid cut-off operated by line pressure variations
  - 4d-11 Gas ignition and extinction devices with heat expansion
- Electrical gas ignition and extinction** (switch design 21c-28 – 21c-45; gas operated fire ignition devices 34d-7/02)
- Electrical ignition devices
- 4d-12/01 in general
  - 4d-12/10 functioning by a hand-opened gas closure element (21h)
  - 4d-13/01 portable, for gas burners with weak current battery
  - 4d-13/10 portable, for gas burners with two-terminal power current connection
  - 4d-13/20 portable, for gas burners with single-terminal power current connection
  - 4d-13/30 Magneto-electric and electrophoric ignition devices
  - 4d-14 Electric remote ignition for gas burners
  - 4d-15 Electric remote adjusting devices for gas cocks and valves on burners (4c-14)
  - 4d-16 Igniting devices for street gas lamps
  - 4d-17 Opening and closing cocks and valves on gas lamps at predetermined times by means of clockwork and intermediate gearing; automatic shutoff devices for gas lamps in timed stairway lighting etc. (the turning of and on of any motive power by means of clockworks etc. 47h-20; gas cut off devices with automatic line shutoff 4c-13)
- Ignition devices for liquid fuel lamps, lanterns, candles**
- 4d-18 Mechanical, pyrophoric ignition devices for liquid fuel lamps, lanterns, candles, with the exception of miners' lamps
  - 4d-19 Mechanical, pyrophoric ignition devices for safety or miners' lamps
  - 4d-20 Electrical ignition devices for liquid fuels and also miners' lamps, candles etc.

**Extinction devices for liquid fuel burners, lamps, lanterns, heating and cooking burners, and candles**

- 4d-21 Mechanical disk-extinguishers (snuffers) for liquid fuel lamps
- 4d-22 Mechanical flap-extinguishers (snuffers) for liquid fuel lamps
- 4d-23 Mechanical sleeve-extinguishers for liquid fuel lamps
- 4d-24 Blow-out devices for liquid fuel lamps, lanterns, candles
- 4d-25 Automatic extinguishing devices for safety or miners' lamps
- 4d-26 Automatic extinguishing devices activated, for example, in case of liquid fuel burners, lamps, heaters or cooking burners over-turning
- 4d-27 Candle snuffers
- 4d-28 Miscellaneous ignition and extinction devices for lighting, also for vapour burners (24b; 24c)

**4e Catalytic gas auto-igniters** (fitting of catalytic gas auto-igniters on the gas lamp, heat burner, etc. 4d-1 – 4d-3; pyrophoric metals and alloys 44b; 78f)

- 4e-1 Chemical manufacture of automatic gas lighters
- 4e-2 Mechanical manufacture and fitting of automatic gas lighters
- 4e-3 Auto-igniting incandescent bodies

**4f Incandescent bodies**

- 4f-1 Incandescent mantles, moistening and impregnating liquids for same
- 4f-2 Incandescent mantles, with different zones
- 4f-3 Metal fabric, calcium pencil and other solid incandescent bodies
- 4f-4 Supporting devices for incandescent bodies, especially the formation and preparation of incandescent mantle heads or holders, and adaptation to the incandescent body (4a-21)
- 4f-5 Manufacture of incandescent mantles: drying, firing, forming, stiffening, collodionisation, trimming; devices for mounting and dismounting incandescent bodies; packing, insofar as this consists of an arrangement of the incandescent body itself (general 81c-27); strength testers

**4g Burners** (burners for gas furnaces 24c; for heating stoves and cooking ranges 36b; for metallurgical furnaces 18b, 18c, 40a, 40d; for distilling retorts 10a-5; for liquid fuel furnaces 24b; for singeing machines 8b); **carburettors for liquid fuels, if combined with a burner** (independent carburettors for liquid fuels 26a, 26c; carburettors forming part of a motor 46c2); **arrangement of the burner in the lamp; connection of the burner with other lamp parts so as to increase the effect of the burner****Wick illumination burners without incandescent bodies**

- 4g-1 Air feed for wick illumination burners
- 4g-2 Wick illumination burners without combustion caps with flat, round or full wicks
- 4g-3 Wick illumination burners with combustion caps
- 4g-4 Inverted wick illumination burners, illumination burners for carriage lamps, regenerative illumination burners
- 4g-5 Alcohol wick burners for heating
- 4g-6 Petroleum wick burners for heating
- 4g-7 Pan burners (24b)
- 4g-8 Tray burners (24b)

**Wick blue-flame burners**

- 4g-9 Parts of wick blue-flame burners
- 4g-10 Wick blue-flame burner with top-burning wick, without combustion disk or cap

- 4g-11 Wick blue-flame burner with top-burning wick, with combustion disk or cap and without wick tube flange
- 4g-12 Wick blue-flame burner with top-burning wick with combustion disk or cap and with wick-tube flange
- 4g-13 Wick blue-flame burner with single-side burning wick, without wick-tube flange
- 4g-14 Wick blue-flame burner with single-side burning wick, with wick-tube flange

#### **Arrangement of the wick in the burner**

- 4g-15 Wick sleeves
- 4g-16 Safety wick sleeves
- 4g-17 Wick adjusters taking hold of the wick
- 4g-18 Wick adjusters taking hold of the wick holder
- 4g-19 Devices for setting the wick, and limiting its upward movement
- 4g-20 Wick inserters
- 4g-21 Slow combustion burners
- 4g-22 Air-gas burners and air-gas lamps in which the carburettor is operated by means of the lamp burner (26c-6)

#### **Parts of vapour burners**

- 4g-23 Carburettors for vapour burners
- 4g-24 Nozzles for vapour burners and cleaning devices for the nozzles
- 4g-25 Mixing tubes, burner heads for vapour burners
- 4g-26 Heating devices for vapour burners
- 4g-27 Regulating devices on the carburettor for fuel feed to vapour burners (4c-10)

#### **Vapour burners (for furnaces 24b)**

- 4g-28 Vapour light burners
- 4g-29 Vapour burners for blow torches and vapour burners for the welding and cutting of metals (autogenous welding and cutting 49h-28, 49h-29, 49h-34, 49h-37; electric welding 21b-29 – 21b-31)
- 4g-30 Alcohol vapour burners for heating
- 4g-31 Vapour burners for heating, vaporiser exposed to an auxiliary flame
- 4g-32 Vapour burners for heating, vaporiser exposed to the main flame
- 4g-33 Vapour burners for heating, vaporiser heated by conduction
- 4g-34 Incandescent vapour burners, vaporiser exposed to an auxiliary flame
- 4g-35 Incandescent vapour burners, vaporiser exposed to the main flame
- 4g-36 Incandescent vapour burners, vaporiser heated by conduction
- 4g-37 Miscellaneous processes and devices for producing burner flames from liquid fuels (24b)

#### **Illuminating gas burners**

- 4g-38 Gas cutting burners
- 4g-39 Gas Argand burners
- 4g-40 Gas burners for regenerative lamps
- 4g-41 Gas burners for overhead and carriage lamps
- 4g-42 Acetylene gas burners

#### **Blue-flame gas burners**

- 4g-43 Pressure gas, and compressed air burners  
Oxyhydrogen burners, blow pipes (4g-29; 4g-37; 4g-55; 49h-28; 49h-29; 49h-34; 49h-37)
- 4g-44/01 for soldering
- 4g-44/10 for welding metals
- 4g-44/20 for cutting metals
- 4g-44/30 for welding and cutting metals, variable heat torch



- 4g-44/40 Underwater burners
- 4g-44/50 for surface hardening of steel
- 4g-45 Oxygen gas burners for heating solid incandescent materials, e.g. lime-light, zirconium-light, and also sleeve-type incandescent materials
- 4g-46 Blue-flame gas burner nozzles: nozzle structure, cleaning, regulating nozzles; nozzles for incandescent gas light
- 4g-47 Feed and regulation of the external and internal combustion air in incandescent gas burners and lamps (for suspended incandescent gas light 4g-54; regulation and feed of external combustion air through lamp accessories 4a-11 – 4a-18)
- 4g-48 Mixing tubes for incandescent gas light burners
- 4g-49 Incandescent gas light burners with pre-heating of the air or gas in the burner
- 4g-50 Incandescent gas light burner heads
- 4g-51/01 Mixing tubes for gas heating burners
- 4g-51/10 Regulating devices for air feed
- 4g-51/20 Regulating nozzles
- 4g-51/30 Devices for the simultaneous regulation of gas and air
- 4g-51/40 Gas heat burners with pre-heating of gases
- 4g-52 Gas heat burner heads, pre-heating of combustion air
- 4g-53 Group incandescent gas light burners, inverted incandescent illuminating gas lamps
- 4g-54 Inverted incandescent illuminating gas burners, inverted incandescent illuminating gas lamps (4a-11 – 4a-18; 4g-47)
- 4g-55 Miscellaneous processes and devices for producing burner flames with gaseous fuels (24c-10)