

**CPC****COOPERATIVE PATENT CLASSIFICATION****F22G****SUPERHEATING OF STEAM** (steam separating arrangements in boilers [F22B 37/26](#))**F22G 1/00****Steam superheating characterised by heating method** (exothermal chemical reactions not involving a supply of free oxygen gas, apparatus or devices for using the heat therefrom [F24J](#))[F22G 1/005](#)

. {the heat being supplied by steam}

[F22G 1/02](#)

. with heat supply by hot flue gases from the furnace of the steam boiler

[F22G 1/04](#)

. . by diverting flow or hot flue gases to separate superheaters operating in reheating cycle, e.g. for reheating steam between a high-pressure turbine stage and an intermediate turbine stage

[F22G 1/06](#)

. with heat supply predominantly by radiation

[F22G 1/08](#)

. . from heated brickwork or the like

[F22G 1/10](#)

. with provision for superheating by throttling

[F22G 1/12](#)

. by mixing steam with furnace gases or other combustion products

[F22G 1/14](#)

. using heat generated by chemical reactions

[F22G 1/16](#)

. by using a separate heat source independent from heat supply of the steam boiler, e.g. by electricity, by auxiliary combustion of fuel oil

[F22G 1/165](#). . {by electricity (steam generation in boilers heated electrically, in general, [F22B 1/28](#))}**F22G 3/00****Steam superheaters characterised by constructional features; Details of component parts thereof** (general aspects of enclosed heat-exchangers [F28D](#))[F22G 3/001](#). {Steam tube arrangements not dependent of location (characterised by location [F22G 7/00](#))}[F22G 3/002](#)

. . {with helical steam tubes}

[F22G 3/003](#)

. {Superheater drain arrangements}

[F22G 3/004](#). {Steam tubes with steam flowing in opposite directions in one pipe, e.g. Field tubes ([F22G 3/005](#) takes precedence)}[F22G 3/005](#)

. {Annular steam tubes, i.e. the steam being heated between concentric tubes with the heating fluid flowing in inner and around outer tube}

[F22G 3/006](#). {Steam superheaters with heating tubes ([F22G 3/005](#) takes precedence)}[F22G 3/007](#)

. {Headers; Collectors, e.g. for mixing}

[F22G 3/008](#)

. {Protection of superheater elements, e.g. cooling superheater tubes during starting-up periods, water tube screens}

[F22G 3/009](#)

. {Connecting or sealing of superheater or reheater tubes with collectors or distributors}

**F22G 5/00****Controlling superheat temperature** (control systems for steam boilers [F22B](#); regulating or controlling in general [G05](#))[F22G 5/02](#)

. Applications of combustion-control devices, e.g. tangential-firing burners, tilting burners

[F22G 5/04](#)

. by regulating flue gas flow, e.g. by proportioning or diverting

[F22G 5/06](#)

. by recirculating flue gases

- F22G 5/08 . . preventing furnace gas backflow through recirculating fan
- F22G 5/10 . by displacing superheater sections
- F22G 5/12 . by attemperating the superheated steam, e.g. by injected water sprays ([spray mixers B01F 5/18](#))
- F22G 5/123 . . {Water injection apparatus}
- F22G 5/126 . . . {in combination with steam-pressure reducing valves}
- F22G 5/14 . . by live steam
- F22G 5/16 . by indirectly cooling or heating the superheated steam in auxiliary enclosed heat-exchanger
- F22G 5/18 . by by-passing steam around superheater sections
- F22G 5/20 . by combined controlling procedures

**F22G 7/00****Steam superheaters characterised by location, arrangement, or disposition**

- F22G 7/005 . {for locomotive boilers ([F22G 7/065](#), [F22G 7/105](#) take precedence)}
- F22G 7/02 . in fire tubes
- F22G 7/04 . in jackets around fire tubes
- F22G 7/06 . in furnace tubes
- F22G 7/065 . . {for locomotive boilers}
- F22G 7/08 . in fire-boxes
- F22G 7/10 . in smoke-boxes
- F22G 7/105 . . {for locomotive boilers}
- F22G 7/12 . in flues
- F22G 7/14 . in water-tube boilers, e.g. between banks of water tubes
- F22G 7/145 . . { of inclined type, i.e. the water-tube sets being inclined with respect to the horizontal plane}