SECTION B — PERFORMING OPERATIONS; TRANSPORTING

B21 MECHANICAL METAL-WORKING WITHOUT ESSENTIALLY REMOVING MATERIAL; PUNCHING METAL

B21J FORGING; HAMMERING; PRESSING; RIVETING; FORGE FURNACES (rolling of metal B21B; making particular products by forging or pressing B21K; cladding or plating B23K; finishing surfaces by hammering B23P 9/04; compacting surfaces by blasting with particulate material B24C 1/10; general features of presses, presses for consolidating scrap B30B; furnaces in general F27)

Subclass index

PREPARING METAL STOCK.....1/00
FORGING; HAMMERING; PRESSING
General methods, equipment therefor.....5/00
Machines, presses, hammers.....7/00-13/00
Lubrication.....3/00
Furnaces.....17/00
RIVETING.....15/00
OTHER BLACKSMITHS' REQUISITES.....19/00

1/00 Preparing metal stock

1/02 • Preliminary treatment of metal stock without particular shaping, e.g. salvaging segregated zones, forging or pressing in the rough (modifying the physical properties by deformation C21D 7/00, C22F 1/00)

1/04 • Shaping in the rough solely by forging or pressing

1/06 • Heating or cooling methods or arrangements specially adapted for performing forging or pressing operations

3/00 Lubricating during forging or pressing (lubricating in general F16N)

5/00 Methods for forging, hammering, or pressing (for working sheet metal or metal tubes, rods, or profiles B21D; for working wire B21F)**; Special equipment or accessories therefor**

5/02 • Die forging; Trimming by making use of special dies

5/04 • by directly applied fluid pressure or explosive action

5/06 • for performing particular operations

5/08 • • Upsetting

5/10 • • Piercing billets (in combination with extrusion B21C 23/00)

5/12 • • Forming profiles on internal or external surfaces (making screw-thread by forging, pressing, or hammering B21K)

7/00 Hammers; Forging machines with hammers or die jaws acting by impact (hand hammers B25D; electrical features section H)

7/02 • Special design or construction

7/04 • • Power hammers

7/06 • • Drop hammers

7/08 • • • with rigidly-guided hammer

7/10 • • with both drive and hammer connected to a fulcrumed lever, e.g. tail hammers

7/12 • • • the lever being a spring, i.e. spring hammers

7/14 • • Forging machines working with several hammers

7/16 • • • in rotary arrangements

7/18 • • Forging machines working with die jaws, e.g. pivoted, movable laterally of the forging or pressing direction, e.g. for swaging

7/20 • Drives for hammers; Transmission means therefor

7/22 • • for power hammers

7/24 • • • operated by steam, air, or other gaseous pressure

7/26 • • • • operated by internal combustion

7/28 • • • operated by hydraulic or liquid pressure

7/30 • • • operated by electro-magnets

7/32 • • • operated by rotary drive, e.g. electric motor

7/34 • • • operating both the hammer and the anvil, so-called counter-tup

7/36 • • for drop hammers

7/38 • • • driven by steam, air, or other gaseous pressure

7/40 • • • driven by hydraulic or liquid pressure

7/42 • • • operated by rotary drive, e.g. electric motors

7/44 • • • • equipped with belts, ropes, cables, chains

7/46 • • Control devices specially adapted to forging hammers, not restricted to one of the preceding subgroups

9/00 Forging presses

9/02 • Special design or construction

9/04 • • Piercing presses

9/06 • • Swawing presses; Upsetting presses

9/08 • • • equipped with devices for heating the workpiece (electric heating elements H05B)

9/10 • Drives for forging presses

9/12 • • operated by hydraulic or liquid pressure

9/14 • • • in conjunction with electric power

9/16 • • • in conjunction with steam or gas power

9/18 • • operated by making use of gearing mechanisms, e.g. levers, spindles, crankshafts, eccentrics, toggle-levers, rack bars
9/20 • • Control devices specially adapted to forging presses not restricted to one of the preceding subgroups

11/00 Forging hammers combined with forging presses; Forging machines with provision for hammering and pressing

13/00 Details of machines for forging, pressing, or hammering
13/02 • Dies or mountings therefor **[2]**
13/03 • • Die mountings **[2]**
13/04 • Frames; Guides
13/06 • Hammer tups; Anvils; Anvil blocks
13/08 • Accessories for handling work or tools
13/10 • • Manipulators (in general B25J)
13/12 • • • Turning means
13/14 • • Ejecting devices

15/00 Riveting
15/02 • Riveting procedures
15/04 • • Riveting hollow rivets mechanically
15/06 • • Riveting hollow rivets by means of hydraulic, liquid, or gas pressure
15/08 • • Riveting by applying heat to the end parts of the rivets to enable heads to be formed
15/10 • Riveting machines (electric heating elements H05B)
15/12 • • with tools or tool parts having a movement additional to the feed movement, e.g. spin
15/14 • • specially adapted for riveting specific articles, e.g. brake lining machines
15/16 • • Drives for riveting machines; Transmission means therefor
15/18 • • • operated by air pressure or other gas pressure, e.g. explosion pressure
15/20 • • • operated by hydraulic or liquid pressure
15/22 • • • operated by both hydraulic or liquid pressure and gas pressure
15/24 • • • operated by electro-magnets
15/26 • • • operated by rotary drive, e.g. by electric motor
15/28 • • Control devices specially adapted to riveting machines not restricted to one of the preceding subgroups
15/30 • • Particular elements, e.g. supports; Suspension equipment specially adapted for portable riveters
15/32 • • • Devices for inserting or holding rivets in position with or without feeding arrangements
15/34 • • • • for installing tubular rivets
15/36 • • Rivet sets, i.e. tools for forming heads; Mandrels for expanding parts of hollow rivets
15/38 • Accessories for use in connection with riveting, e.g. pliers for upsetting; Hand tools for riveting
15/40 • • for forming rivet heads
15/42 • • Special clamping devices for workpieces to be riveted together, e.g. operating through the rivet holes
15/44 • • Rivet hole positioners
15/46 • • Positioners for rivets for making tube joints
15/48 • • Devices for caulking rivets
15/50 • • Removing or cutting devices for rivets

17/00 Forge furnaces (furnaces for heat treatment C21D 9/00; furnaces in general F27)
17/02 • electrically heated (electric heating elements H05B)

19/00 Blacksmiths' requisites not otherwise provided for
19/02 • Hearths; Air supply arrangements specially adapted therefor
19/04 • Anvils; Associated items