

Bench Grinder

5 A bench grinder is a benchtop type of grinding machine used to drive abrasive wheels.

Technical Specification → Bosch G1B01 8 Bench Grinder 8 inch 600W with grinding wheel

10 Operation → A wire brush wheel or buffing wheels can be interchanged with the grinding wheels in order to clean or polish workpieces.

Bench grinders are standard equipment in metal fabrication shops and machine shops as are handheld grinders. It is used for

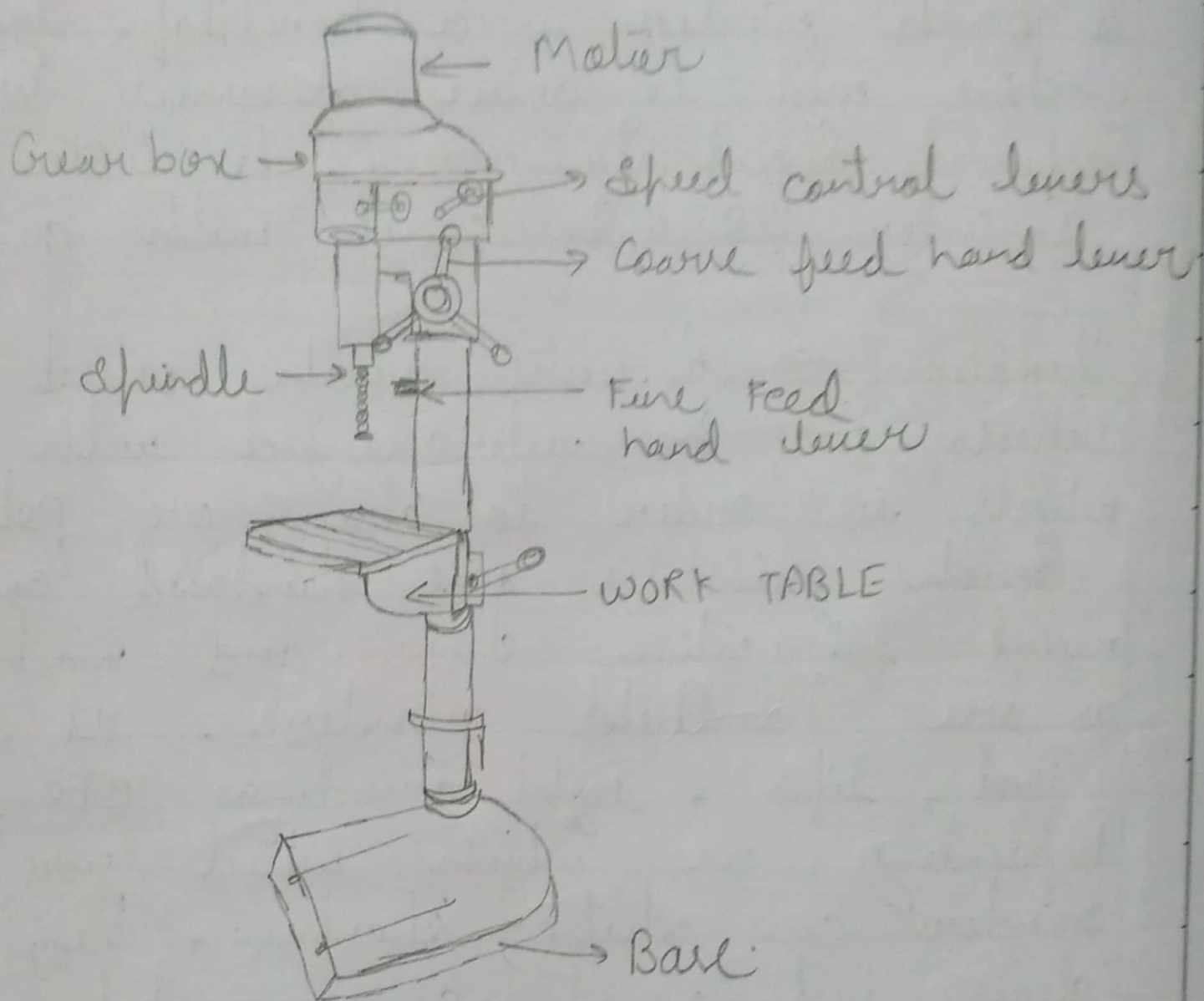
15 Tool, tips, light grindings etc.

Depending on which wheel you add, a bench grinder can shape, sharpen, buff, polish or clean just about any metal object.

20 Eighty - or 100-grit wheels are best suited for delicate jobs, like shaping metal model parts and inefficiently peeling potatoes.

The combination of rough grit and constant motion will keep the metal from overheating. Stop heating up wheels. This will prevent the microscopic cracks that can develop from cooling a hot tool too quickly.

Teacher's Signature: _____

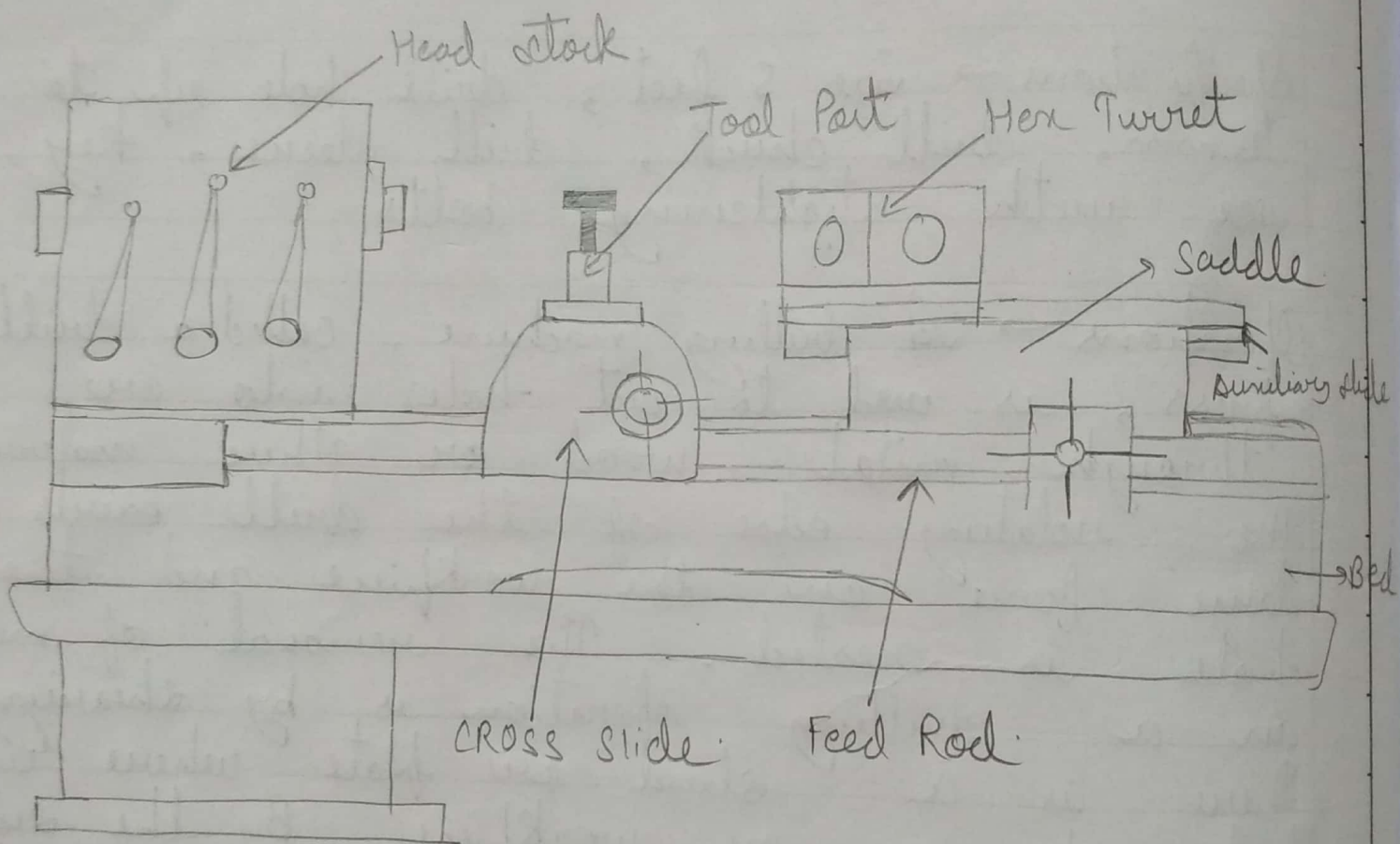


PILLAR DRILLING

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Specifications → size 5 feet, drill hole up to 15 mm, drill chuck, drill sleeve, key, vice with tightening bolts

Operations → A drilling machine, called a drill press, is used to cut holes into or through metal, wood or other materials. The rotating edge of the drill exerts a large force on the workpiece and the hole is created. The removal of metal in a drilling operation is by shearing. There is a stand or plate where we put specimen or workpiece. By the side of the machine there is a wheel to control the depth and drilling. We can too change the tools or the sizes of the drill. This machine is of the most common and useful machine employed in industry for producing turning and finishing holes in a work piece.

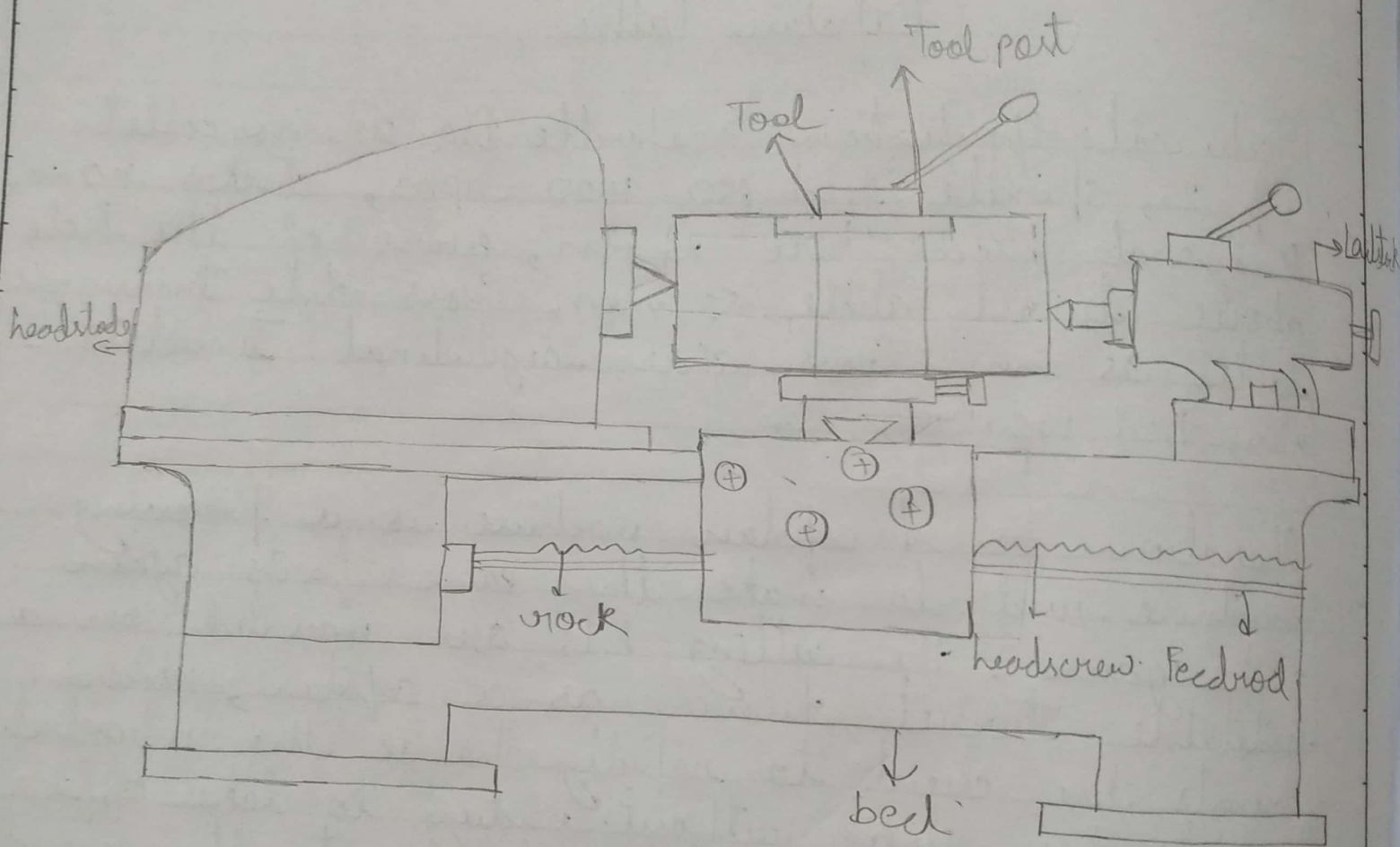


Capstan Lathe

Capstan Lathe

Technical Specification \rightarrow Spindle Dia. 28 mm collet
Cap- 25, spindle feed 150-1600 rpm, strokes 110 mm
Hexagonal Head bore: 25 mm, centre of the hole
above turret slide 55 mm, Cross slide transverse
table 95 mm, Cross slide longitudinal Travel 300
mm, Bed 1050×170 mm.

Operation \rightarrow A capstan machine is a processing
machine used to make the same parts again
and again. The cutting bits are mounted on a
rotatable turret known as a capstan, which
permits the client to rapidly change the introduction
of bits for slicing without needing to take off
the first bit and afterward mount the second.
A bit of crude material, off and on again
known as a blank, is mounted into the
capstan machine and is then spun at
high velocity. The cutting apparatus, some of
the time known as blades, are then used
to slice into the blank to make another
shape or outline. In total It is used
for Turning, Parting, Knurling, Centre drilling,
Internal threading etc.

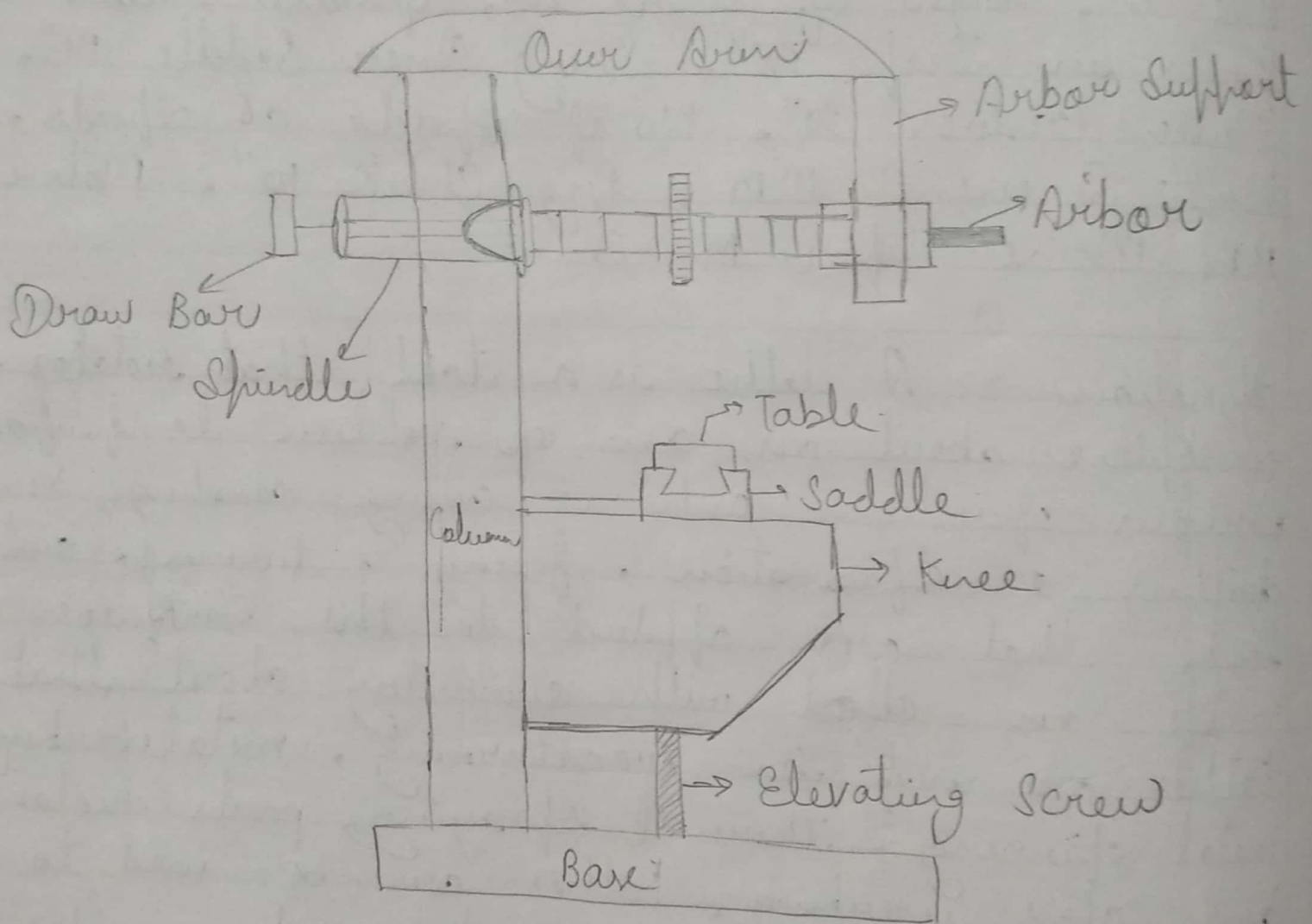


LATHE

Lathe

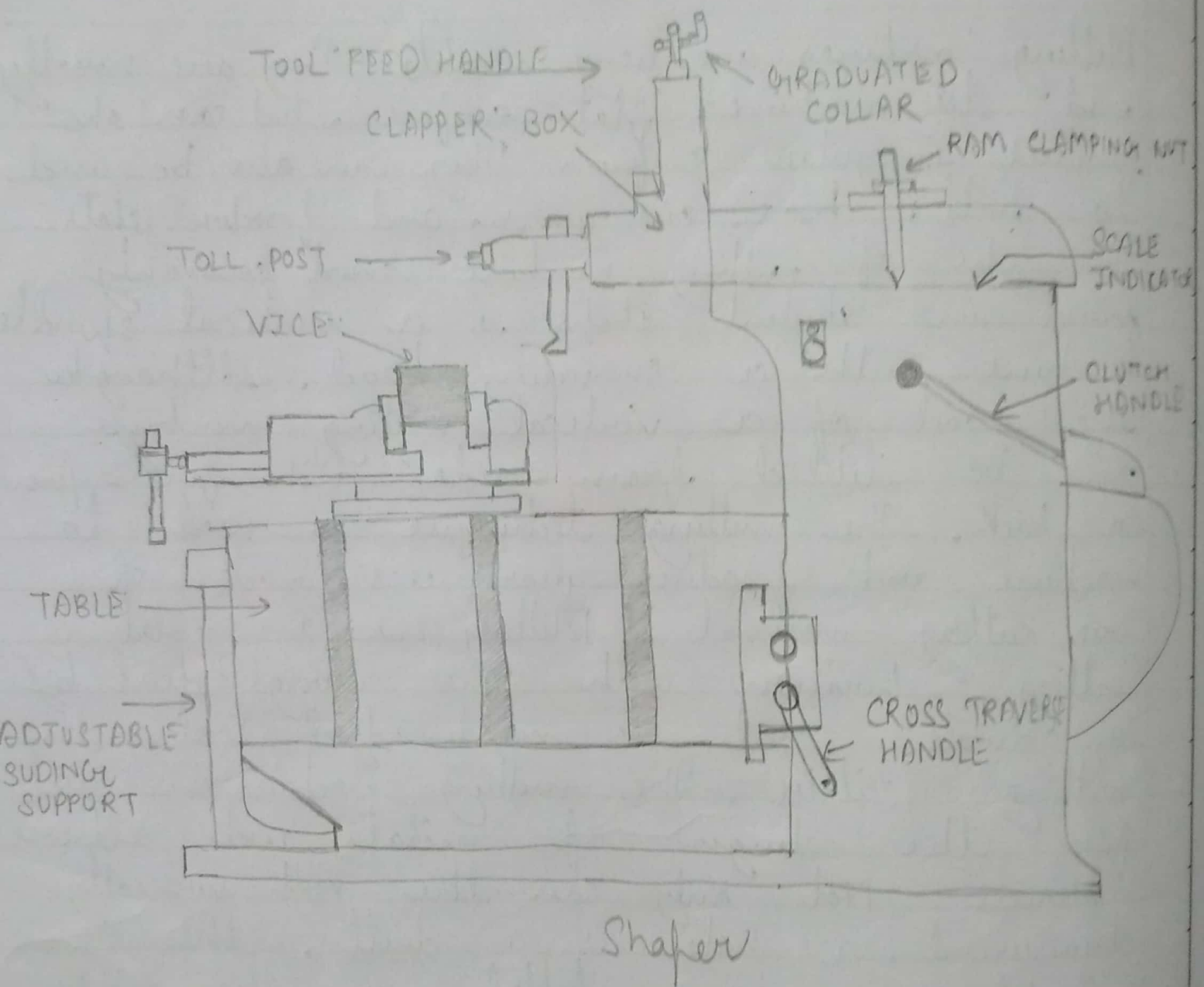
Technical Specification \rightarrow length of Bed: 4'-6". Width of Bed: 12", Height of Centre 10", Spindle Hollow 02", Swing in Gap 28", Swing Over Saddle 14", Distance between Centres 21", No. of speeds 06 speeds, Lead Screw 37 M.M, Dog-Chuck 10", Motor 3 H.P, Morse Taper M.T. 3.

Operation \rightarrow A lathe is a tool that rotates the workpiece about an axis of rotation to perform various operations such as cutting, sanding, knurling, drilling or deformation, facing, turning, with tools that are applied to the workpiece to create an object with symmetry about that axis. Lathes are used in woodturning, metalworking, metal spinning, thermal spraying, parts reclamation, and glass working. Lathes can be used to shape pottery, the best known design being the potter's wheel. Most suitably equipped metalworking lathes can also be used to produce most solids of revolution, plane surfaces and screw threads or helices.



Milling

Milling machines are very versatile. They are usually used to machine flat surfaces, but can also produce irregular surfaces. They can also be used to drill, bore, cut gears, and produce slots. The type of milling machine most commonly found in student shops is a vertical spindle machine with a swiveling head. Although the head of a vertical milling machine can be tilted from side ^{to side} and from front to back. The milling technique is used to machine and produce workpieces made of free-cutting material. Milling is a metal cutting operation with the cutting done by a single-edged or multi-edged tool, the milling cutter. The milling machine is used for the design of metal and other materials. Not only can the mill vertically downward, a hole as a drill, the material may be installed in the side of the tool and the shaping of the edges. With a milling machine, many different tasks can be performed.



Shaper

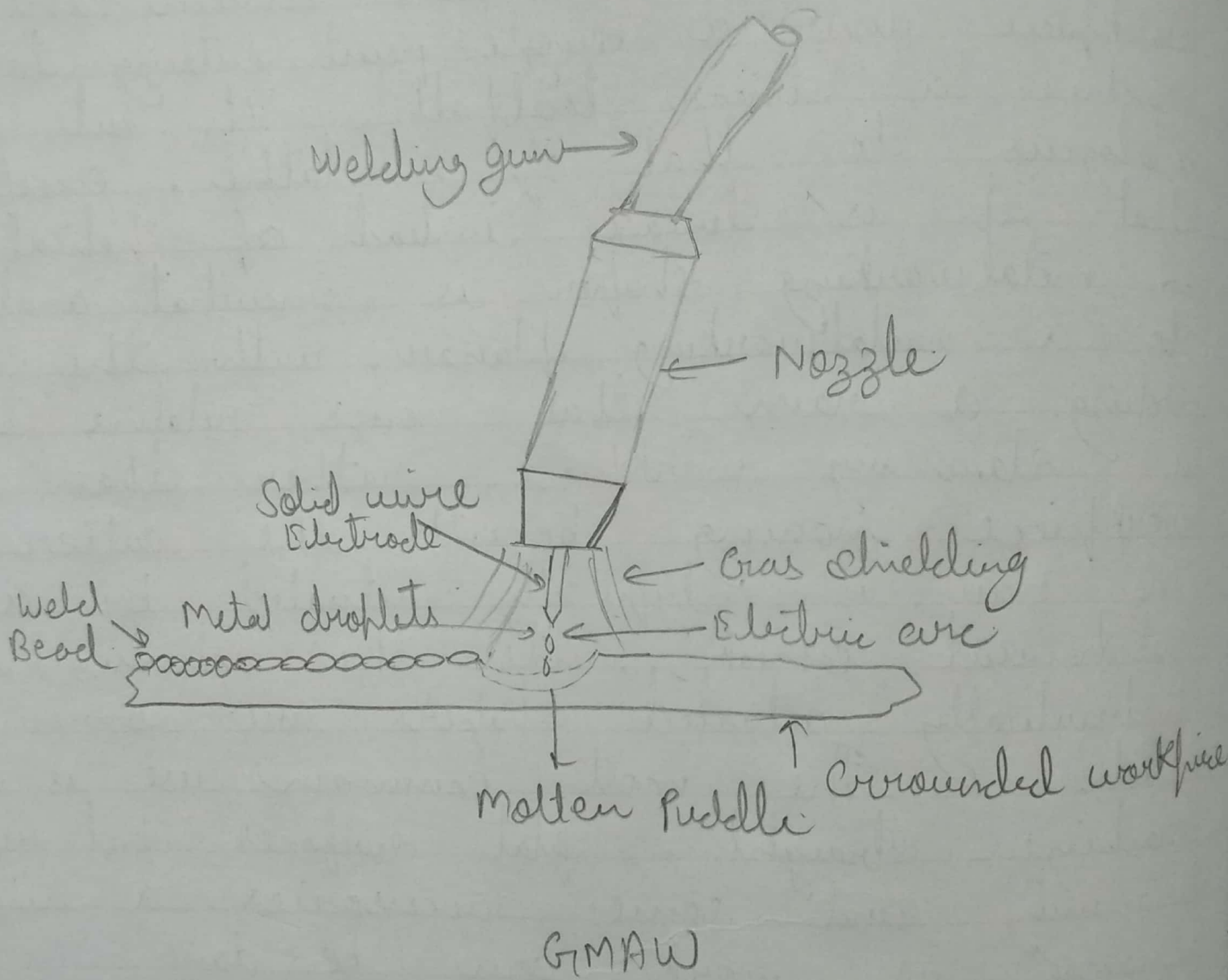
A shaper is a type of machine tool that uses linear relative motion between the workpiece and a single-point cutting tool to machine a linear toolpath. Its cut is analogous to that of a lathe, except that it is linear instead of helical.

A metalworking shaper is somewhat analogous to a metalworking planer, with the cutter riding a ram that moves relative to a stationary workpiece, rather than the workpiece moving beneath the cutter.

The ram is typically actuated by a mechanical crank inside the column, though hydraulically actuated shapers are increasingly used. The most common use is to machine straight, flat surfaces, but with ingenuity and some accessories a wide range of work can be done.

Uses.

- Keyway, spline, and gear tooth cutting in blind holes.
- Internal splines and gear teeth.



GMAW

Operation → Gas metal arc welding, sometimes referred to as metal inert gas (MIG) or metal active gas (MAG) welding, is a welding process in which an electric arc forms between a consumable wire electrode and the workpiece metal which heats the workpiece metal, and causing them to melt and join.

Along with the wire electrode, a shielding gas feeds through the welding gun, which shields the process from contaminants in the air. The process can be semi-automatic. A constant voltage, direct current power source is most commonly used with GMAW, but constant current systems as well as alternating current, can be used.

GFC and OFW

Any fuel welding (OFW) is a group of welding processes which join metals by heating them with a fuel gas flame or flames with or without the application of pressure and with or without the use of filler metal.

OFW includes any welding operation that makes use of a fuel gas combined with oxygen as a heating medium. The process involves the melting of the base metal and a filler metal, if used by means of the flame produced at the tip of a welding torch.

Fuel welding fuel gas and oxygen are mixed in the proper proportions in a mixing chamber which may be a part of the welding tip assembly.