Objective :-

To make a v-butt joint by welding two metal pieces.

Introduction :-

Welding is a fabrication that joints materials usually metals or thermoplastics, by melting the work piece and adding a filler material to form a pool of matter, molten material that cools to become a strong joint, with pressure sometimes used in conjunction with heart or by itself to produce the weld. welding provides a permanent joint but it normally affects the metallurgy of the compounds.

Weldability :-

The Weldability can be defined as property of metal, which indicates the ease with which it can be welded with other similar or dissimilar metals.

Weldability depends on:

* Melting point
* Thermal conductivity
* Thermal expansion
* Surface condition
* change in micro structure.

→ Melting process finds innumerable application because of availability of a wide variety of electrodes, big range of metals, and their alloys can be welded easily.

Arc- Welding Process:-

The process in between an electrode and a workplace or between two electrodes is utilized to weld lease metals is called an Arc- Welding Process. This type of welding is versatile, portable and cheap.

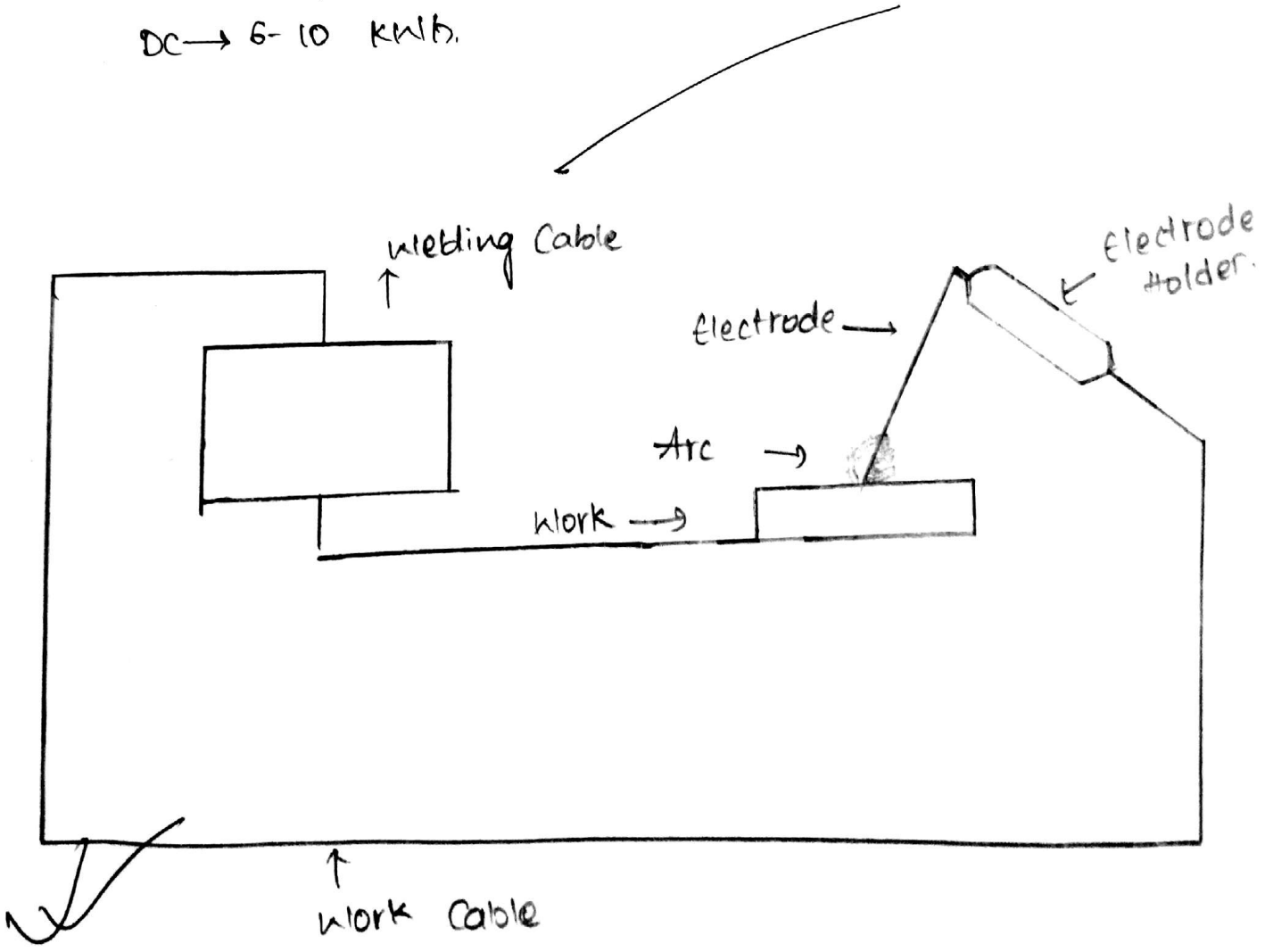
Constituents of Arc Welding Process:-

It consists of a rectangular steel tank mounted on 3-tyred wheels, the front wheel, survivelling and steerable. An oil cooled double coorked step down transformer reduces the supply main windings are enclosed in steel tanks.

Energy

AC → 3-4 KWh

DC → 6-10 KWh.



Equipments and Tools:-

* Transformer:-

→ Alternating current source derives from main voltage 220V.

→ Provision of regulation to vary current as per requirement.

→ Step down transformer stopping voltage upto 80V

→ Arc voltage requirement around 17V for metal welding.

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* Electrode (Coated consumable electrode) :-

It is an electrical conductor used to make contact with non-metallic part of circuit to hold it.

* Connector :-

A pair of electric cables supplying power from a welding machine to the work, being done.

* Electrode Holder:-

A hand hard clamp that holds a welding rod and conduct electricity through the rod.

* Chipping hammer:-

Used for any kind of demalition work

* Earthing clamp :-

An equipment which is used to connect metal enclosure of the welding machine.

* Wire Brush :-

A brush with tough wire bristles for cleaning hard surfaces.

* Helmet :-

A safety device used to protect head from sparks while welding.

* Safety Goggles :-

A safety device used to protect eyes from high intensity radiation and also sparks while welding.

* Hand Gloves :-

A safety device used to protect hands from heat produced in the handle while doing arc welding.

* Try Square :-

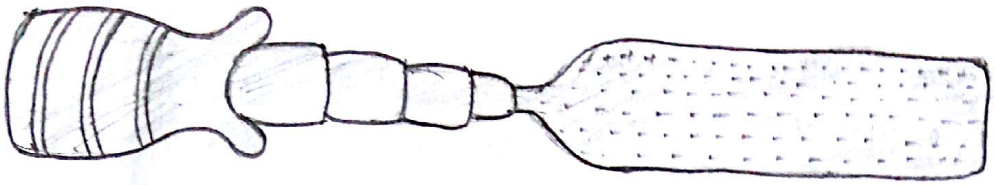
Used to sketch and check 90° of the job and also the level of the slab.

* Bevel Protractor :-

It is used to measure the angle at the V-butt.

* Bench Wire :- It is most commonly used. It's one jaw fixed to side of the table while the other is kept movable by means of a screen and a handle. The vice is made of iron metal and steel.

Tools Used



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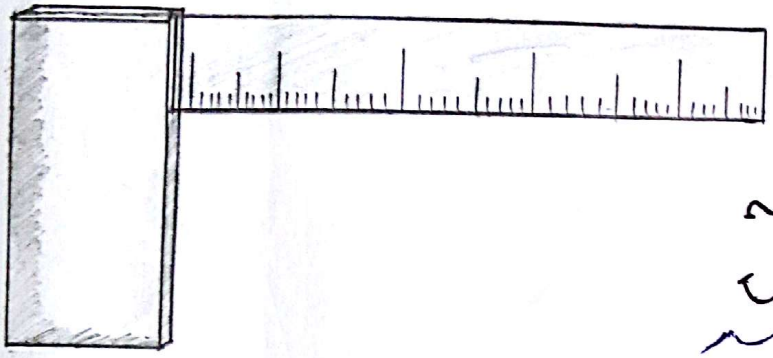
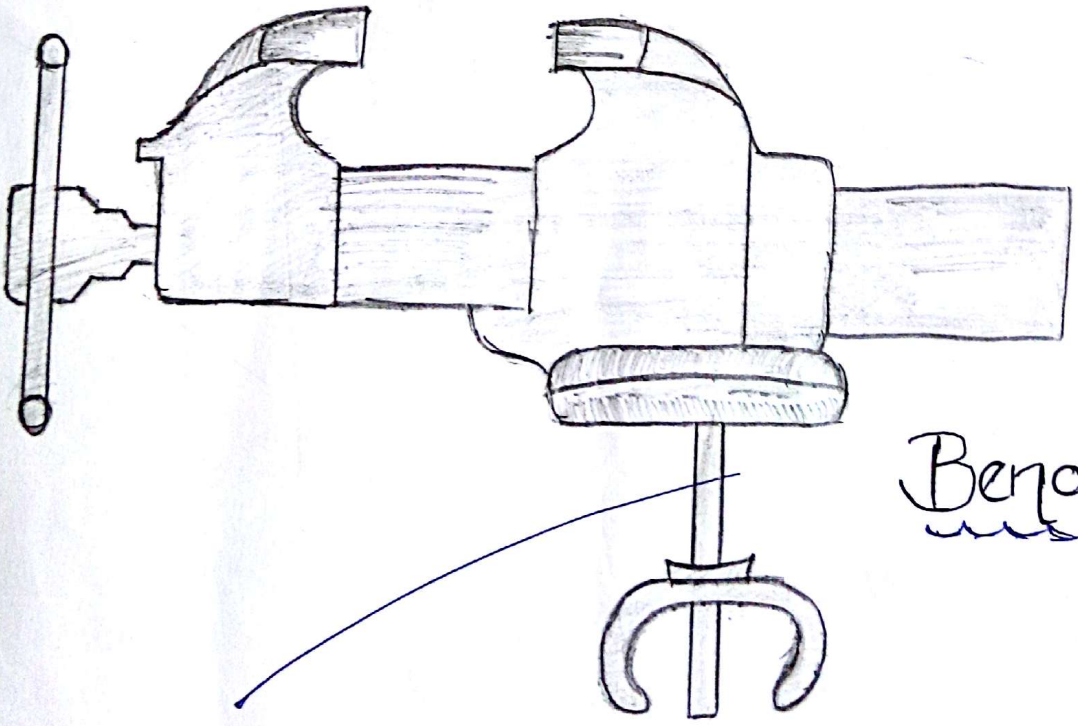


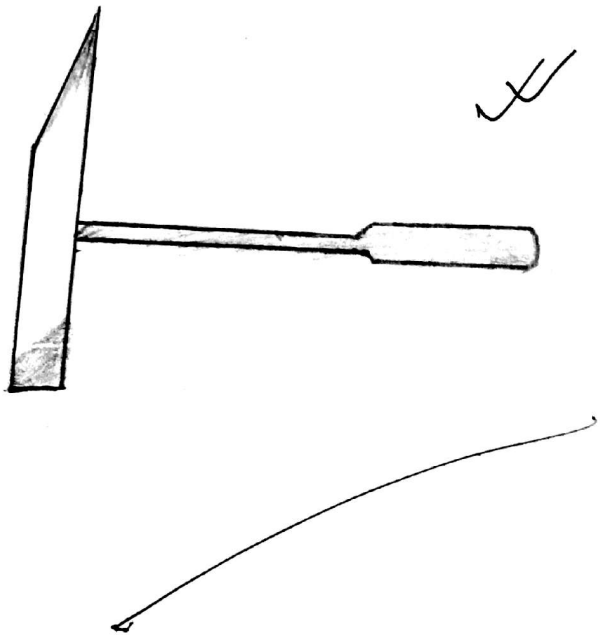
Try Square

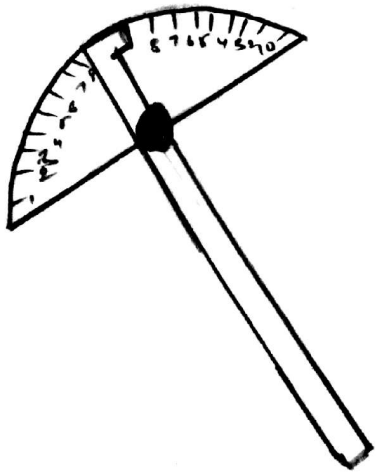


Bench Wise

Electrode

Chipping Hammer





Bevel Protractor

Procedure:-

The given work pieces are filled the work piece is filled upto thirds of the total depth. After the work pieces are filled in the 'V' shape, filing is done on all surfaces of slab to remove any amount of rust on any deposit on the surfaces of the slab.

Then the workpieces are joined using the method of arc welding. In arc welding, machines or tools like electrode, cable wire, holder etc any safety equipments like hand gloves, helmet, googles etc are used.

First we have to rub the electrode to some other Metal piece for the trip to become red hot, which has to be placed on the stand to generate heat, then it is used to melt work pieces.

Welding has to be done uniformly keeping the electrode just little away from the work piece Welding clamps were attached to the metal piece. Electrode were attached in the electrode holder. The welding machine were then turned on. The point where we wished to begin was selected.

Tip of electrode against metal to complete circuit, then instant put it back little bit, to an electric arc between the tip of electrode and metal. The electrode should be at 70°C, once the electric arc is generated hold the gap steady so that a continues arc will occur from electrode to job. While welding it was done slowly and straight

Operation Performed:-

* Filing:- The slab or workpiece is filled as to remove the rust and to make angle of 45° with the vertical.
* Marking:- The two pieces are marked whether where they have to be welded.
* Joint Preparation:- The 'V' shaped joint is welded using electrodes of arc welding machines.
* Surface cleaning:- After welding is finished the surface is cleaned to remove any flux

Precautions:-

→ First know what the substance is that's being welded any coating on it
→ Protective clothing for protection sports, hot spatter and radiation should be dry and free of oils, grease, other substances which may burn.
→ Keep your hands away from plume and never look at a flash.
→ Use your helmet and head position to minimize fume inhalation in your breathing zone
→ Don't weld in wet areas.
→ Don't coil the electrode cable around your Body.
→ Make sure there is a good local exhaust, ventilation to keep the air in your breathing zone.
→ Locate the nearest fire extinguisher before welding
→ Deposit all scrapes and electrode butts in proper waste container.

Remarks:-

Welding is quite an intresting job and is done very carefully. It is difficult to coeld because the metal's position is not visible through the glass. Chipping of metal can hurt the finger. So hammer should be used carefully. We intuitively realise that all safety precautions are to be followed Carefully.