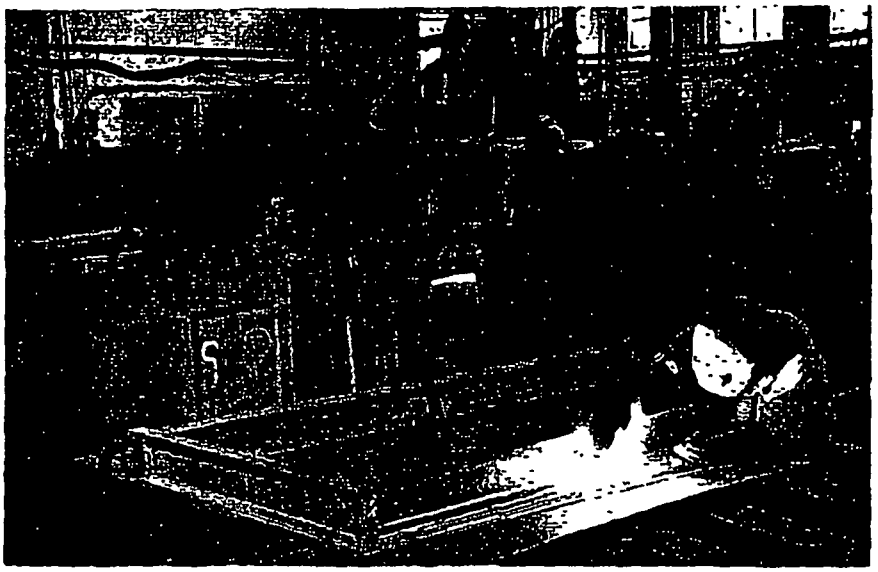


Fig. 29-8 Cable and hose are suspended to keep them clear of work area on this gas-shielded arc welding operation

distance from the welding unit Protect cables that must be laid on the floor or ground so that they will not interfere with safe passage or become damaged or entangled

8 Take special care to keep welding cables away from power supply cables or high-tension wires.

Gas-shielded arc welding

Gas-shielded arc welding (Fig 29-8) is used for joining all types of metals and castings In gas-shielded methods, only one electrode is used A gas or gas mixture is introduced through the torch to surround the electrode and the welding point like a shield. The gas cone protects the molten weld puddle from the atmosphere and stops oxidation of the base metal The electrode conducts either alternating or direct current to provide heat

In gas-shielded *tungsten* arc welding, the electrode does not melt and is not used for filler metal The electrode is tungsten, which is highly resistant to heat and non-consumable in the welding process

In gas-shielded *metal* arc welding, the electrode melts and provides the filler metal (the word "metal" used in the title of this type of welding signifies that the electrode is consumable as filler) The need for filler rods on light gauge metals is eliminated if the pieces to be joined are fitted up closely The pieces are generally cut in a die and held in place with clamps or are set up in jigs for maintenance of close contact. The clamps also prevent distortion of the metal from heat Because the gas shields the weld area, flux is not necessary and the spattering of molten metal associated with other types of welding generally does not occur

Argon, helium, carbon dioxide, and mixtures of these gases are used to shield the welding zone from the atmosphere Argon, having greater density, does not mix with the surrounding air as rapidly and is more widely used than helium in the welding of light-gauge metals The greater penetration obtained with helium makes it useful