

# Holding

## odd-shaped and heavy components

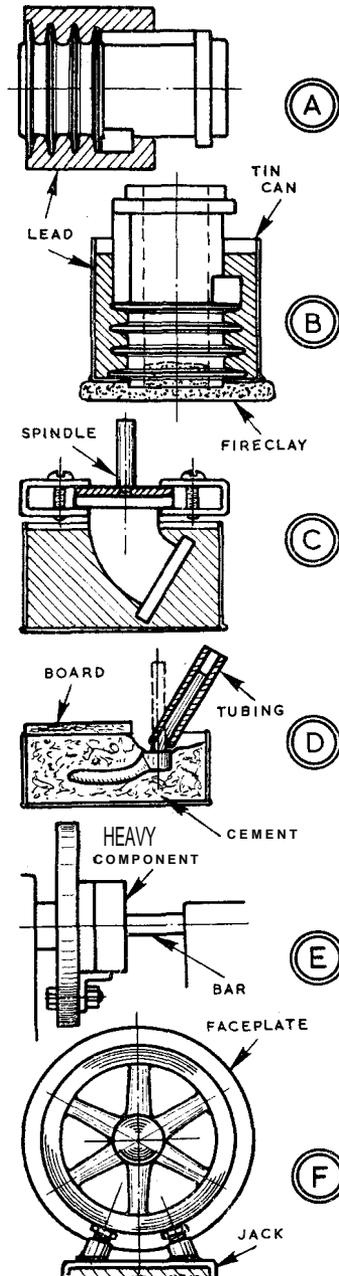
By GEOMETER

**F**OR components on which machining is necessary, it is wise in the design stage, to consider the manner of setting up. If this is not done problems can arise, except on straightforward parts, which could have been solved easily by arranging on the pattern for a boss, flange, series of lugs or other projections to be cast integral with each component for it to be held during machining. Afterwards, of course, the unwanted portions can be cut off.

This method is more applicable to one-off jobs and small scale production than for mass-production where waste material and extra machining time would need to be considered. Then the solution can be a special jig to hold components as they are, without cast-on chucking features.

In the case of a single small or moderate size component, or a few of awkward shape which cannot easily be held, it is often possible to provide a hold by running round with lead or scrap white-metal—the latter obtained from engine bearings. This proved effective for a small finned cylinder casting, as at *A*, enabling it to be held in a four-jaw chuck for machining the bore, spigot and end face. Means of holding, as by extending the flange, had been omitted. A simple grip on the fins was impossible—because of varying size; and at the opposite end, a hold on the flange would have been far too short. Besides, heavy pressure of chuck jaws would, no doubt, have distorted the casting, resulting in the bore being out of round with the pressure released. Encasing in lead was done as at *B*.

The cylinder was set with its end through the bottom of a tin can in a bed of fireclay, which dried out as the cylinder and can were heated with a blowlamp before the lead was poured. The hole was cut truly with a V-tool in the lathe, with the can pressed on a wood mandrel made from a block turned in the chuck.



This ensured that the cylinder stood centrally with the lead casing of uniform thickness.

Heating the component to be encased is always important for the lead to flow freely—and particularly as in this instance where it had to enter between fins of narrow pitch. Moving the blowlamp from the ladle to the component turn and turn about is all that is necessary, or the set-up component can be stood on a piece of sheet metal on a stove to heat. A ladle can be improvised from a strong can with a riveted handle. If the heat is held so that the poured lead is liquid for a considerable period, it is advisable to put a weight or pressure on the component to prevent its rising and metal running out beneath it.

For a component located from its top face, a pouring set-up can be made on a vertical drilling machine, as at *C*. A spindle for holding in the chuck can be reduced at the end and riveted into a washer or plate, to which a component with flange or similar feature can be clipped. The can forming the mould will stand on the drill table on a parallel tibrebrick or piece of asbestos. In all cases, the can may be tom off in strips at the finish, using pliers. Black-leading the inside will minimise sticking.

By the encasing method, it is often possible to hold a component for straightening without damage or disfigurement, as was the case with the chromium-plated door handle of a car, bent close to its stem but otherwise unharmed. For this, it was convenient to bind the polished part with insulating tape and set in cement in a flat can. The cement having hardened, a board was placed on top to hold in the vice, and the stem pulled square with a length of close fitting tubing, as at *D*. Then the can was stripped off and the cement broken away.

Heavy components can be held to the faceplate in several ways for clamps to be fitted. The tailstock can be used, or a bar on the saddle, as at *E*, with an angle or strip providing a rest. For a heavy wheel, a jack as at *F* is convenient, made from bar, to locate on the lathe bed, with welded on threaded sockets for screws. □