

Fitting and joining PIPES

By GEOMETER

OF simple ways of joining pipes, the more common are by screwed fittings when there is sufficient wall thickness; by clamping when walls are thin; and by sleeves placed over or inside the pipes, then soldered or brazed, when it is required to make permanent attachments.

Screwed fittings are used for conduit and water pipes, the end of each pipe being threaded and screwed into a sleeve *A*. In the case of water pipes, leakage is prevented by screwing the sleeve to the end of the thread on the pipe, using jointing compound. Serated jaw grips or pipe wrenches are used for the screwing together and dismantling.

Pieces of straight pipe can be joined in this way to make a permanent system. However, if pipes are long, bent, or sections need to be removed

-without undue disturbance, a running sleeve joint *B* must be used where required. One piece of pipe is threaded far enough for the sleeve to be run back clear, when, if the pipes are flexible, they can be pulled sideways and one screwed out. The joint on the long thread is made with a lock-nut, using a ring or grommet of yam or tow treated with jointing compound. This is wound round and the lock-nut pulled tight.

On this principle, a piece of pipe can be fitted between two others, *C* and the sleeves run on to these, then the lock-nuts screwed up, *D*. Most simple pipe and domestic water systems have joints of this type, and correctly installed it should be possible to remove and renew damaged sections without undue difficulty.

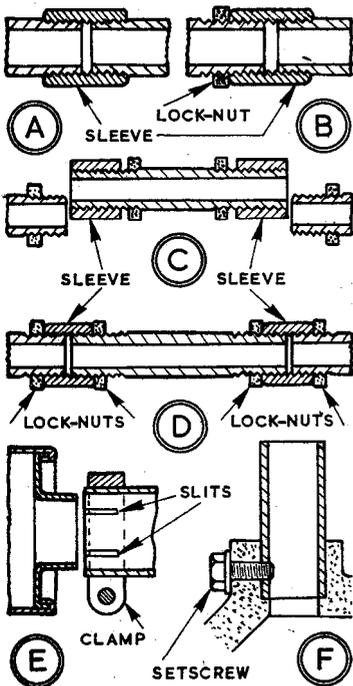
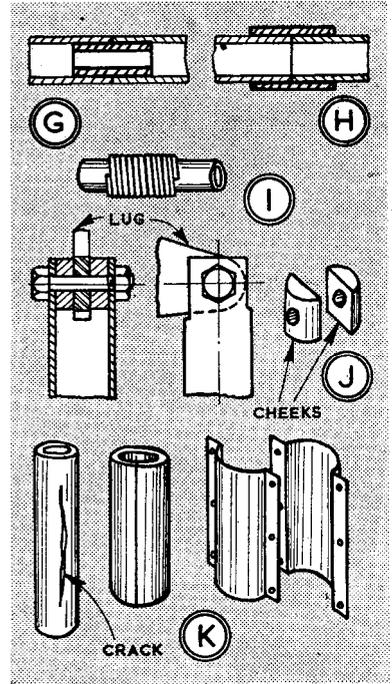
Other types of fittings

Air pipes and exhaust systems of i.c. engines often employ clamp fittings, of which *E* shows an example. The pipe locates with a good fit over another or on a spigot and is slit in a number of places to be held with a clip and bolt or a worm-drive clip. Leakage at the ends of slits is prevented by their being shorter than the spigot or other part.

A pipe of medium wall thickness, round and accurate to size, may be a push fit in a casting and secured by a setscrew entering a hole in the side *F*. Removal of the setscrew permits the pipe to be twisted and pulled out and in fitting it should be ascertained, with a rod or wire, that the holes are in line.

Pipes may be permanently joined as *G* and *H* by a sleeve inside or out. When they are of brass, copper or steel and to be soldered, the surfaces should be tinned beforehand. An internal sleeve may be kept central by its being a tight fit in one pipe, or by drilling a small hole and fitting a pin.

Pipes which are to be brazed should be clean and have flux applied and may be drilled in several places to run the brazing material in, when the sleeve is inside. For a structural purpose, where an internal solid plug could be used instead of a hollow sleeve, the latter is better for brazing,



because of the easier and more uniform heating—that is, a solid plug may not heat sufficiently for the brazing to run through the joint. A pipe which is cracked may be repaired and strengthened by binding with clean wire, then soldering over, *I*.

For a structural purpose, a firm mounting for a pipe or tube on a flat lug, to permit of movement as on a camera tripod, is as *J*. The tube is slit to accept the lug, and drilled cross-wise for a bolt. To maintain the shape and admit of the joint being tightened solid or to the degree of friction required, a pair of cheeks are sawn and filed (or machined) from rod which will just push into the tube. They do not require fixing other than by the bolt passing through.

A split water pipe can be temporarily repaired without dismantling, *K*. Any bulge is hammered down, then a piece of rubber and canvas car water hose is slit lengthwise and sprung over (the bore should be approximately the same as the outside of pipe). Fixing is with a halved sheet metal clamp, formed round a bar, flanged and drilled for screws and nuts.