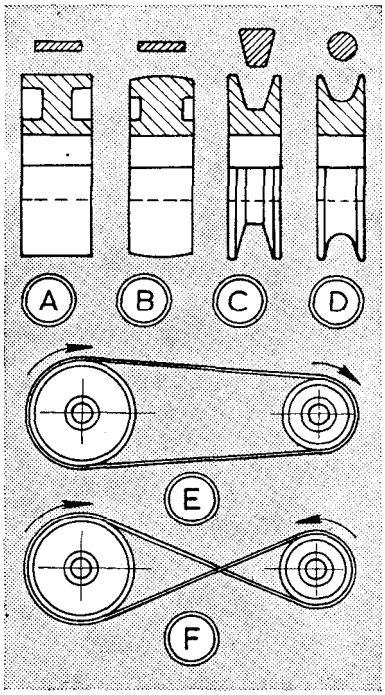
Different types of BELT DRIVES



OF THE DIFFERENT means for transmitting power between shafts, belts and pulleys are undoubtedly the simplest and, within their application, possess virtues lacking in gears- and chain and sprocket drives.

By Geometer

With belts, shafts can be relatively distant, out of line in certain respects, or even at right angles. Flexibility and slip absorb shock, and with flat and round belts rotation can be reversed. No lubrication is required-although on large flat belts dressing is generally used to maintain flexibility and limit slip.

There are disadvantages, of course, by comparison with gears or chain and sprockets, chiefly in regard to slip. Gears in particular admit very large ratios or differences of speed between shafts in close proximity, whereas with a belt on very small and large pulleys severe slip would occur as a result of the reduced arc of " wrap round " on the smaller pulley. Consequently, in the average short-centre belt drive it is wise to limit the pulley ratio to about 1 to 4 (1 in. and 4 in. pulleys), though for light drives or if the " wrap round " is increased by jockey pulleys, the ratio can easily be increased to 1 to 10 or 12.

Diagrams ***A, B, C, D,*** show common belt and pulley sections. Flat belts of leather or canvas composition are employed on flat or slightly crowned pulleys, ***B,*** this feature causing the belt to centralise itself on the pulley and not run off as might be supposed. For light drives with flat belts of about 1 in. width, as in small workshops, leather is generally the best material and, after initial stretching, will run for long periods with little attention. Joints can be made by chamfering the ends and stitching with thin string or strong thread. To shorten, the stitches can be picked out, the end(s) rechamfered and restitched.

Standard sections

Vee-belts, C, are of one-piece canvas and rubber construction, and provide the best form of simple drive. They are in a variety of sizes and lengths for industrial use and automobile dynamo and fan drives. No difficulty should be experienced in filling particular needs.

Round belts, ***D,*** for light workshop drives are of leather about &in. dia. Joining can be chamfering the ends and stitching and binding though common metal fasteners consist of two sleeves, each threaded internally for the belt to " screw" in, and one sleeve having an eye, the other a hook, for joining.

Pulleys for such belts should be round section in the bottom, with flanges fairly deep and slightly flaring to keep the belt on; for this type has a propensity to run off the pulleys at times, particularly when using metal fasteners.

An open belt drive is as ***E,*** and in small sizes either pulley can be the driving one. But in an industrial drive the left-hand pulley would be the driving one, the " pull " side of the belt at the bottom and the " slack " side at the top to provide increased " wrap round " and better drive on the pulleys. A crossed belt drive, providing reversed rotation, is as ***F,*** and either pulley can be the driving one.

Belts should not be run too tight since extra power is required and increased strain will be involved. Nor should they be so slack as to permit slip or flap. In jointing flat belts the run must be straight at the join or the belt may tend to run off the pulleys.

Shafts should be parallel in plan, not as G, which would cause a flat belt to run off. In the case of vee-belts this condition tends to cause them to turn on their sides.

A worn pulley, H, can spoil a flat belt by it mountmg a flange (old type Austin Seven fan pulley); the remedy is *to* recrown the pulley as **I** by machining in a lathe.

With multiple vee-belts it is important for pulley sizes to be the same and all belts the same length and width (renewed in sets), so all run at the same diameter-not as J, where differences of ratio are involved. Vee pulleys can be checked to this effect with a gauge or by means of a straight-edge laid across and a round rod in the vees, K.