

# PROFILE PROJECTOR

By GEOMETER

VIRTUALLY every toolroom today has a profile projector to support its standards of accuracy by projecting small shapes to large dimensions; and any model engineer can obtain good results in copying the principle of this with a camera, enlarger, or simple projection lens. Examination can then easily be made of small drills (for angle and length of cutting edges), form tools, contour gauges, thread gauges, gear teeth, commercial screws, etc. This reveals errors and where corrections should, if possible, be made.

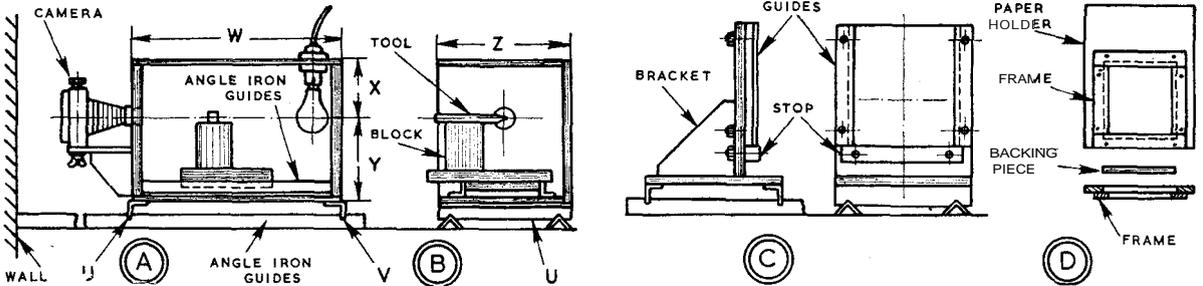
off the guides); Z, 9 in. (for some interior space).

The camera is set on a bracket-stiffened shelf outside the box-held by a stud with wing-nut fitted in the tapped hole by which mounting can be made on a tripod. The back is fully open, the lens at maximum aperture, the shutter on "time." A hole in the end of the box lets the light through.

Aiming at a wall some distance away, switching on the light and holding a small tool inside the box, it is easy to find the position from which a sharp and considerably-enlarged profile is thrown on the wall. With a lens having an aperture of 4.5 or larger, the profile is clear and

and attached to a 9 in. square base, to which a vertical piece is screwed and stiffened by a bracket. Diagrams can be clipped to this, and likewise photographic paper-though for neat photographs further additions are necessary. These are a holder for the paper; and guides and a stop on the vertical part of the carriage.

The stop is square wood; the guides are flat wood with a fronting of strip metal. The paper-holder of plywood as at D, slides in them. It is made by cutting an aperture the size of the photographic paper and fronting this with a frame of overlapping strip-wood (picture frame); then providing a backing piece to put in the aperture behind the photo-



Cost is at a minimum and all work on the apparatus can be done with hacksaws, drills and files. It can be assembled and dismantled in minutes and will stand anywhere-on bench, table, or floor. The camera is not altered in any way-and is, in fact, put to good winter use.

The basic apparatus is as at A and B. The body is an open-sided box on angle iron guides which are 1-1/4 in. on the flat, and about 4 ft long. Nothing is done to them. They do not move. But two pieces of angle iron of similar section, U and V, screwed or bolted, one to each end of the box, have Vs sawn and filed about 8 in. apart. These slide on the guides.

The box can be in any wood or assortment of woods-solid and ply types.

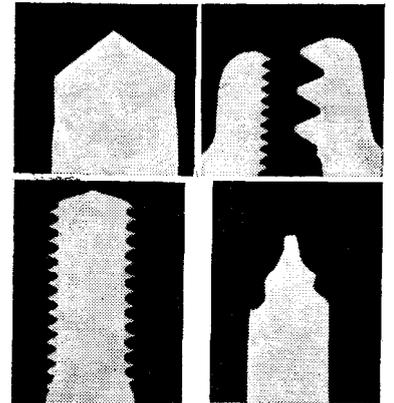
Dimensions are at choice, though the following are recommended-W, 16 in. (to permit fitting a condenser later to use the device as a photo-enlarger); X, 4 in. (to the centre of an enlarger bulb in a holder in the top); Y, 6 in. (for a reasonable height

satisfactory with room lighting. But for maximum contrast, the open side of the box is covered with a cloth and the room lighting switched off. This is done for taking a profile on to photographic paper-when, of course, the tool must be supported inside the box and a sheet of sensitive paper suitably set up.

Support for tools in the box can be arranged in various ways if there are guides for a simple carriage on which the tool-supporting device, such as the block shown, can be stood or clamped. The guides can be 3/4 in. angle iron; and if angles U and V are moved in from the ends, they can all be drilled to take bolts right through. The carriage can be two pieces of flat wood, screwed together, one on top of the guides, the other between them.

To make the projector independent of a wall, set up photographic paper or hold large drawn diagrams conveniently (for comparing profiles). A carriage as at C is required. Two more angles like U and V are prepared

graphic paper. The whole can then be dropped in the guides to hold of its own accord. □



Profile projections. Top: (left) A small drill, (right) Thread gauges. Below: (left) A commercial screw. (right) Projection of a form tool