wards across the two supports so that the thin section is immediately above the surface of the silica-glass, and about 1 mm. from it. The two slides should have their longer axes perpendicular. The arrangement is shown in fig. 1.

Sufficient chloroform is poured into the dish to immerse the upper (glass) slide completely. After about half an hour, solution of the

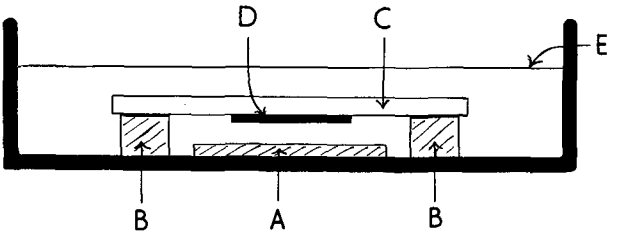

FIG. 1. Diagram, vertical scale exaggerated, showing transfer arrangement. A the Vitreosil slide, B glass supports, C the glass slide, D thin section, E surface of chloroform.

Canada balsam will allow the thin section to become detached from the glass slide, and to fall vertically onto the silica-glass slide. The glass slide is then gently manœuvred to the side and the chloroform removed with a dropper, the rest of the process being the same as that already described.

This method of transference causes the section to be inverted, but providing photomicrographs, upon which the measured crystals can be plotted and replotted, are taken before and after heating, no difficulty should occur in tracing individual crystals.

My thanks are due to Dr. G. F. Claringbull and to Mr. P. M. Game for advice in the preparation of this note.

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A section-holding chuck for use on high-speed surface-grinding machines.

THIS note describes an improved section-holding chuck for use on the table of a high-speed surface-grinding machine fitted with a diamond-impregnated grinding wheel. It also suggests modifications in mounting technique, and some measurement limits for this type of grinding.

The chuck. This chuck, built by Mr. E. W. Davies of this Department, holds seven mounted sections for simultaneous grinding, but the number can be varied according to individual needs and size of table (fig. 1). The seven mounts are held by the chuck in the same plane parallel to the axle of the surface-grinding wheel. Each slide is raised and secured

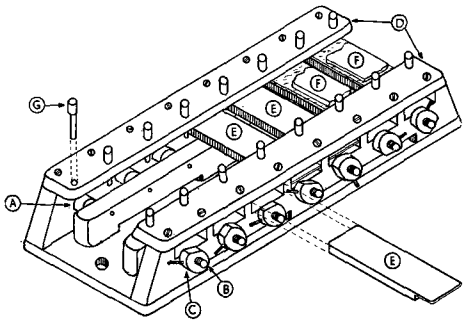

FIG. 1.

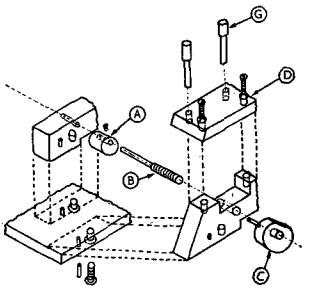

FIG. 2.

FIG. 1. Isometric drawing of the chuck. A, silver-steel cam: B, silver-steel cam screw: C, cam lock-nut: D, clamping bars: E, slide support plate: F, section clamped in grinding position: G, studs.

FIG. 2. Expanded view of the cam mechanism.

against two clamping bars normal to the axle of the wheel. These bars are machined to have their under-surfaces in a common plane parallel to the table of the surface grinder. By this method the upper surface of each slide lies in a common plane (the grinding plane) regardless of inequalities in individual slide thickness. In consequence slides need none of the measurement and pre-grinding to uniform thickness that have been suggested for other clamping methods.

Each slide lies on a thick metal base plate, resting at each end on cams set beneath the clamping bars. These cams are tightened independently and have their own lock-nuts (fig. 2). The system, which is secure and adequate to withstand the strains of high-speed grinding, permits the individual mounting and removal of slides from the side of the chuck, a practice more flexible than serial mounting from the ends of the chuck. If for any reason one of the cams is not secured, the section base plate and the slide will drop out of the grinding plane. In this way a loose slide cannot foul the grinding wheel and shatter.

Mounting technique. The need for uniform thickness of the Canada balsam film between the rock slice and the slide, together with the need

to avoid brittleness in that film, call for modifications in the mounting of sections for grinding under a high-speed wheel. The following procedure has been found successful: the rock slice is placed on a balsam film on the slide, and the mount is turned over and pressure applied to the slide above the centre of the slice. This will orient the slice parallel to the slide surface. With practice a similar pressure applied to a series of slices by this method will achieve a uniform thickness in the balsam film on each of them. The strain on normally prepared Canada balsam produced by a surface-grinding wheel will usually cause it to spring from the slide, and this is overcome by giving the balsam slightly less than the normal 'cooking' when mounting. The degree of 'undercooking' must be discovered by experience, too little 'cooking' resulting in warping and rucking of the balsam film, with damage to the thin slice. When the best conditions are realized there is neither springing nor warping, and the slice is evenly ground.

Grinding technique. As the bases of the rock slices rest on a nearly identical thickness of Canada balsam film, measurement of the progressive grinding of one slice is all that is required in grinding all seven slices. One of the slices is measured by micrometer before it is mounted on a slide. In clamping the seven slides in the chuck this 'master slice' is placed at one end, and the table is raised until the grinding wheel touches it. From this datum level grinding is continued (0·01 inch traverses have been found suitable) until the limit of machine grinding is approached. The two final traverses may be taken at 0·004 inch and 0·002 inch respectively (all these measurements being read from the scale on the height adjustment of the table). Experience suggests that the limit of machine grinding is reached when the slice is 0·006 inch thick. Machine grinding below this thickness causes damage to the slice. Final grinding by hand on fine carborundum completes the process.

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Rockbridgeite from Cornwall and Devon.

The iron phosphate, dufrenite, has been recorded from a number of localities, its first and hitherto only known British occurrence, at Wheal