Projectoscope

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The desirability of a device by means of which an enlarged picture, so to speak, of massccuite. syrup, and sugar samples could be projected on a screen for visual inspection by several people simultaneously has been known for some time. While projectors have been designed for this purpose before, the one of which a description follows has some advantages over previous types, particularly in that the ground-glass viewing screen produces a better image and the instrument may be located in the factory on the pan floor, since it is not necessary that it be situated in a darkened room to be used.

The projector employs a standard Bausch and Lomb dissection microscope equipped with a 10x triplet lens. The other optical parts are two, being (1) a front surfaced, aluminized mirror 4 inches square and 3/16-inch thick inclined at an angle of 45° with respect 1o the optical axes of the microscope and the viewing screen and (2) a piece of ordinary double-strength window glass 7 incites square and ground on one side with No. 600 carborundum powder until the surface of the glass is completely frosted. It is not necessary that, either the mirror or the viewing screen be optically flat. It is highly desirable, if not necessary, however, that the mirror be front-surfaced and aluminized. It is important, incidentally, that such a mirror be not touched with the fingers nor cleaned by ordinary methods, because the aluminum surface is easily marred. While the projected image may not be perfectly sharp to the very edges of the screen, a sufficient area of the specimen is covered by the 10x lens so it is amply large to be seen from an appreciable distance by several observers. The distance from the screen to the lens is approximately 35 inches, and from the lens to the specimen about 1-inch. These dimensions give a magnification of approximately 35x. A type T-10, 200-watt projection lamp within a suitable housing provides adequate illumination even where there is considerable extraneous light. No condensing lenses are necessary since the concave mirror of the microscope serves the dual purpose of condensing and, at the same time, directing the light upward through the specimen and lens. The projector housing is constructed of plywood and is painted a flat black inside. The mirror is further protected from dust by having the aluminized surface downward. Provision is made for easy removal of the microscope and the viewing screen for cleaning. The whole should be mounted on a steady support to minimize vibration.

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While the idea is not new and originality for it cannot be claimed, the projectoscope was used very frequently this past campaign, being placed on the pan floor where it was readily accessible for examination of sugars, massecuites, and syrups, and several operators have expressed the opinion that it has been of considerable value to them in sugar end control.

The outstanding advantage of such a device is that it provides visual inspection by a group rather than by only one person at a time; defects and irregularities of sugar end products are pointed out. and seen simultaneously by all observers. This, of course, cannot be accomplished with the ordinary magnifier or microscope.

Due credit must be given J. B. McDonald for his suggestion of the application of the principles of the device in our industry and to Ivan E. Enwall for his assistance in the designing and building of the instrument.

Beet Laboratory Pulp Mixer

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In a beet testing laboratory where a great, number of individual samples of beets are tested for sugar content each day, it is necessary for greatest accuracy, that the pulp samples produced by the rasp be thoroughly mixed before analysis. Primarily because of this fact and also because the mixing of these samples by hand is very laborious and the quality of mixing is (questionable at times, it was decided to design a machine which would eliminate to a considerable degree the labor as well as the human element involved. The following is a description of the machines which have proved highly successful in our beet laboratories during the past three campaigns.

To a 3-inch fiber pulley is attached a steel spur pinion which drives two brass gears. The gears are attached to 5/16-inch shafts, running vertically in bronze bearings fitted with Zerk grease fittings. On the opposite ends of the shafts are two %-inch hubs counter bored for 5/16-inch shafts. The two beaters are 4 inches across and 4 inches long and are constructed of No. 8 brass spring wire formed into a horseshoe shape. The wires are held in cross-bars, made of 1/2-inch key steel, by safety set-screws. A 1/4-inch shaft attached to each pair of cross-bars is inserted in the 3/4-inch hubs and is held by a set-screw. The bearing assemblies are held, by means of a 3/8-inch cap screw-, between two pieces of 1/2-inch by 3-inch flat iron on one of

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