Observatory, Johannesburg. The University of Michigan southern station is on Naval Hill, Bloemfontein; the Yale University southern station is in the grounds of the University of the Witwatersrand, Johannesburg.

The southern branch of the Harvard Observatory is at Mazelspoort, about fourteen miles outside Bloemfontein.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

SHAKING MACHINE FOR ANALYTICAL WORK

THE world's industrial progress has been measured by a number of different inventions, especially applied mechanical devices. When time became very precious, as it is in our days, human ingenuity had to stretch its limits seeking some machinery to save labor and energy.

A chemist in his laboratory, for example, knows how to appreciate all his apparatus which make him able to carry on his research or routine work quite conveniently. The shaking process, which is sometimes an important factor in analyses, is a very tedious and time-consuming operation. Yet, using a properly constructed shaking machine, the process becomes easy and simple. The shaking machine will do good and rapid work in many instances.

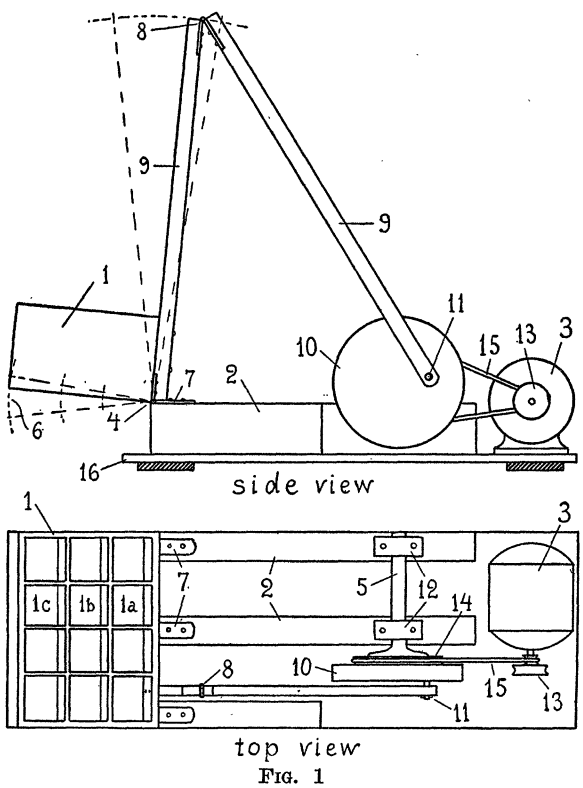

FIG. 1

The accompanying diagram represents one of the many useful shaking machines which have been designed and used in my laboratory of experimental embryology. This machine consists of a box with compartments (1) hinged to a base (2) and brought into a swinging motion by an electric motor (3) through a mechanical "system of four-links chain," where (4) and (5) are the axes of oscillation and rotation, and (6) is the maximum amplitude of swinging. Other parts of the machine are indicated: the hinges (7) and (8), shear legs (9), fly wheel (10) with crank and pin (11), bearings (12), motor pulley (13), driving pulley (14), belt (15) and base plate (16).

The shaking can be done in the box (1) with several samples under various amplitudes of swinging. The first row of compartments (1a) provides mild, the second (1b) moderate and the third (1c) intense shaking. If it is necessary, the amplitude of swinging in the machine can be easily adjusted by displacing the crank pin (11); and the speed of rotation can be regulated by the speed of the motor (3), using either a rheostat or several sizes of driven motor pulleys (13).

The machine described above, owing to its double action, or "swinging motion," might be particularly desirable in a thorough but gentle shaking or in any other special type of analytical work.

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AN APPLICATION OF STREAK AND HARDNESS USED IN CLAY GRADING

THE streak of a mineral is commonly used by mineralogists and geologists in its determination when the hardness of the mineral is less than that of the streak plate, but it is seldom that the mineral specimen itself serves as the streak plate for another substance and is thereby identified. This latter method, however, is used by workmen mining diaspore clay in Missouri to estimate the quality of the diaspore in the clay pits.

They have observed that when a lump of diaspore clay is broken by either a pick or "gad" (a steel wedge) a dark mark, the streak of the abraded steel tool, is left upon first-grade clay, whereas the inferior clay is only crushed or compressed where it is tooled. The workmen speak of the clay as "blacking" or "marking" well when the streak left upon the clay boulder by the iron tool is distinct.