

TOOL-ROOM, INCLUDING GRINDING AND HEAT TREATMENT

The following is an analysis of the work completed in the Tool-room during the twelve months ending 31st March, 1946: gauges (772), heat treatment (1,388), grinding (272), cutters (milling, &c.) (73), miscellaneous tools (771), taps (509), dies (52), chasers (74), hobs (17), end mills (64), reamers (35), mandrels (15), and collets (36).

The following items deserve special mention:—

(1) Jig borer centrescope. This instrument was designed at the Laboratory and may be fitted to a jig borer, enabling the optical location of boring centres to be made.

(2) Button-type ring gauges for $\frac{5}{8}$ in. Cordeaux thread insulator pins have been made in New Zealand. The diameter of the rollers was made to compensate for the large helixangle of the insulator pin by increasing the diameter twice the size of the pin and giving it a left-hand thread with two starts. Chasers for the manufacture of the pins were also made.

(3) Shrink fitting by the use of carbon dioxide snow has been adopted extensively with excellent results.

(4) Special thread grinding of form relieved gear cutters and taps (Enfield, Edison, gas, &c., forms) has been undertaken successfully. Boiler stay taps and bent nut taps have been thread ground from the solid in tool steel.

(5) Four hundred sets of three-thread rolls for the production of cycle spokes in New Zealand were made and a further request for two hundred additional sets has been received.

(6) Reed valves for vacuum pumps being made in New Zealand for installation of refrigerators. These valves contain a metal leaf which must be ground precisely to a thickness of the order 0.01 in.

(7) Miscellaneous components have been made for the Powers Samas statistics analysis machines used in the Treasury Department.

(8) Sliding microtomes for use in the microscopy of thin sections of animal and vegetable tissue.

(9) The repair of a seed-packeting machine for a New Zealand seed-merchant's firm was successfully completed.

(10) Thermostat flexible metal capsules were made for a New Zealand indenter of egg-incubators who was unable to obtain replacement supplies overseas.

(11) Extrusion tools for the manufacture of toothpaste-tubes in New Zealand.

(12) Precise worm shafts for meteorological balloon theodolites were thread ground.

(13) A microhypodermic syringe capable of delivering an exact but minute quantity of liquid of the order 0.1 millilitre was constructed for the use of the Cawthron Institute.

(14) Electrically recording anemometers for attachment to meteorological balloons were designed and constructed.

(15) Morse trainer heads for automatically transmitting signals to aircraft were built for Air Department.

(16) The reclamation of worn reamers by hard chrome-plating, and subsequent regrounding, has been successfully carried out for a New Zealand firm assembling motor-cars.

(17) Several types of diffusion pumps for producing vacua have been made and a considerable understanding of the operation of these pumps is being obtained. Successful diffusion pumps for operation with the molecular still (see Design Section) have been made. Measurements are proceeding to determine the performance of these pumps.

(18) Racks and pinions for incorporation in weighing-machines being produced in New Zealand.

(19) Crossheads for meat-saws being made in New Zealand.

(20) Miscellaneous thread-ground components for incorporation in plastic dies have been made. Clean and accurate threads resulted in the finished plastic product.