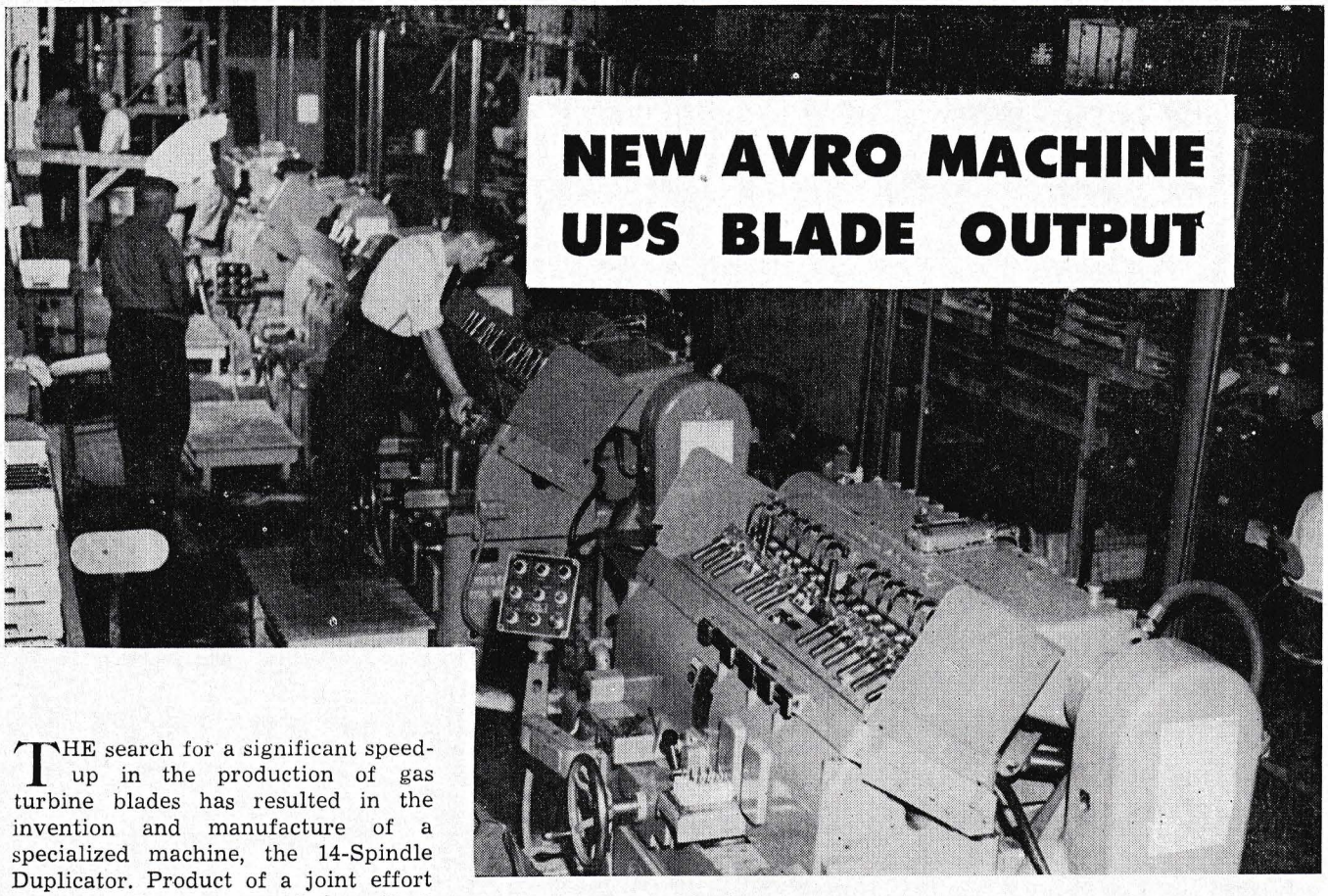
NEW AVRO MACHINE UPS BLADE OUTPUT



THE search for a significant speed-up in the production of gas turbine blades has resulted in the invention and manufacture of a specialized machine, the 14-Spindle Duplicator. Product of a joint effort by Avro Canada and Modern Tool Works, the new machine is now at work producing blades for the Orenda engine.

This duplicator is particularly important in view of the recognized world shortage of gas turbine blades for the compressor and the turbine.

As its name implies, the basic principle of this machine is that of duplicating or tracing the contours of a master blade form simultaneously on to 14 work pieces. This is done through a hydraulic tracer system. The head, carrying the tracer stylus and 14 spindles, pivots on bearings at either end through the action of a hydraulic cylinder. The spindles themselves are driven from a common shaft by 90-degree skew bevel gears and each spindle can be removed for servicing.

The master blade and blade blanks are held by a special fixture on the work table which moves on precision bearings under the spindle head. As the spindle head pivots downwards towards the work, the stylus engages the master blade and while the spindle head continues its arc of travel the work table is actuated to and from the end mills under the exacting control of the hydraulic tracer, thus generating the desired form.

After each cutting stroke the spindle head raises clear of the work and the table automatically indexes longitudinally at a pre-selected feed rate in readiness for the next cutting stroke. An electro-hydraulic control system makes the complete machining cycle automatic. The accuracy and fine surface finish produced by this machine reduces further finishing operations to a minimum.

From the operational experience gained to date on these machines, it is apparent that their use has cut the time required for the manufacture of a blade to approximately a quarter. It is fully expected that an improved type of cutter will reduce the number of machining cuts required, thereby further substantially increasing the rate of production. Accuracy has not been sacrificed to achieve the increased production rates; the blades produced on the 14-Spindle Duplicator compare very favorably with those produced on other machines.

Taken all round, the Tracermatic 14 Spindle Duplicator is proving to be invaluable for the rapid manufacture of accurate turbine and compressor blades of complex form.

Further details of the machine are obtainable from Avro Canada, of Malton, Ontario, or from Canadian Patents and Development Limited, of Ottawa, to whom the patent rights have been assigned.

View from above and rear of Avro Canada's new Tracermatic 14-Spindle Duplicator for making gas turbine blades.

Then there is the story of the 2,000,000 passengers who traveled on a single Western Air Line flight from Los Angeles to Denver. They were ants, shipped by a chap name of Hornaday, known as "Ant King of the World." The Ant King uses the insects to populate glass-enclosed ant villages in which he can study their habits.