

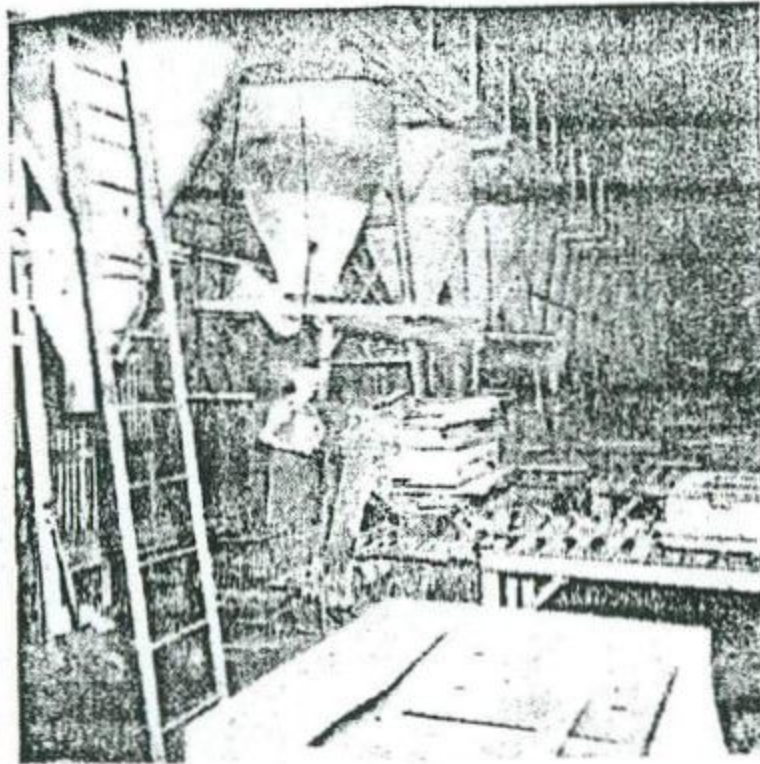
THE STORY OF HOWARD AUTO-CULTIVATORS



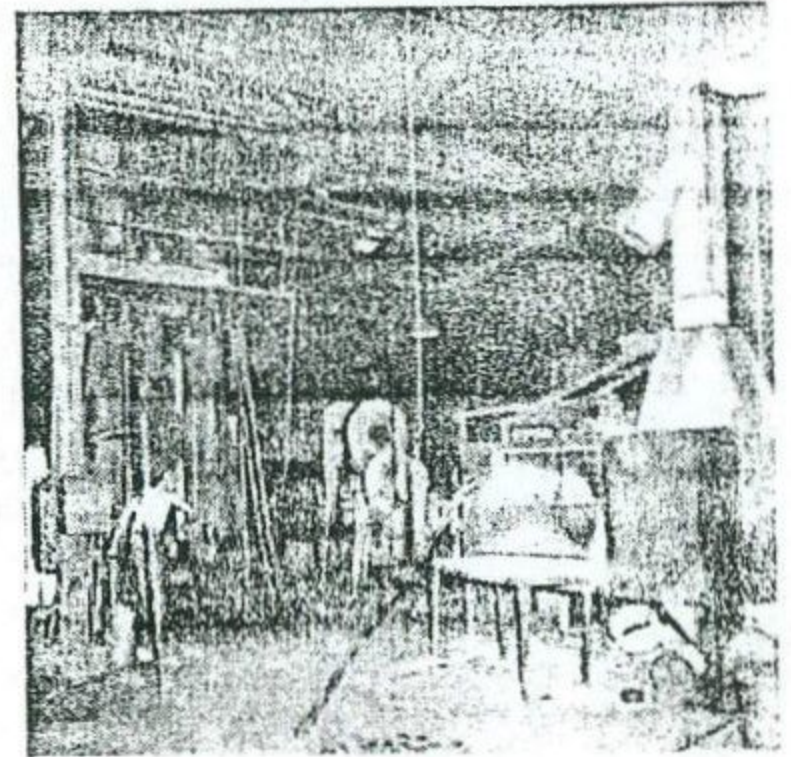
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Section of Sheet Metal Shop.



Section of Foundry Moulding Station, Howard Auto-Cultivators Ltd.



One ton Massey hammer, hitting between 25 and 30 tons.

The Company's turn-over in 1924 was £1,056, but by the next year it had jumped to £10,204, a sound indication of the rapid growth of interest by farmers in the obvious advantages of rotary tillage.

By then the capacity of the small workshop at Moss Vale was overtaxed and the handicap of being so far away from sources of supply of material and labour so apparent, that a move was inevitable. However, as early as 1923 a new site had been surveyed and, in March, 1927, the business was transferred to its present position at Northmead, near Parramatta, N.S.W.

Here a new model with a 36 in. width of cut and an 8 h.p. M.A.G. twin-cylinder engine was produced, and this, together with radical improvements to other models, sent production up by leaps and bounds, while the staff had grown to fifty by 1932.

In this year, an important decision was made. Experience had shown that the motor-cycle type of engine used on the small models left something to be desired, so a

5 h.p. single-cylinder engine was designed for the "Junior" Rotary Hoe, and an 8 h.p. twin-cylinder engine for the "Eight" Rotary Hoe. To achieve this new development, the factory was enlarged and a foundry installed. In the following year, 1933, the name of the Company was changed to Howard Auto-Cultivators Ltd.

By then, Howards had produced the first Australian-made tractor with an Australian-made engine, and the introduction to the market in 1934 of the "DH22" tractor and rotary hoe was a major achievement in providing a powerful 27 b.h.p. unit with a wide range of rotary hoeing and travel gears, and an ability to tackle the toughest cultivation conditions. This success was quickly followed by a 12 h.p. twin-cylinder, water-cooled rotary hoe known as the "Twelve".

Some idea of the Company's expansion during the years 1933-1938 may be gained from the fact that sales increased 600 per cent., and personnel from 50 to 650, working two shifts per day to try and keep production up to orders.

In 1936 a four-wheel-drive Tractor was produced, the N.S.W. Government Railways taking delivery of some thirty of these machines for shunting loaded coal trains with a dead weight of up to 300 tons.

In common with many other manufacturers, however, the Howard Factory was diverted to the production of vital materials during most of the war years, only returning to more normal production, as far as supplies of raw materials permitted, in 1946.

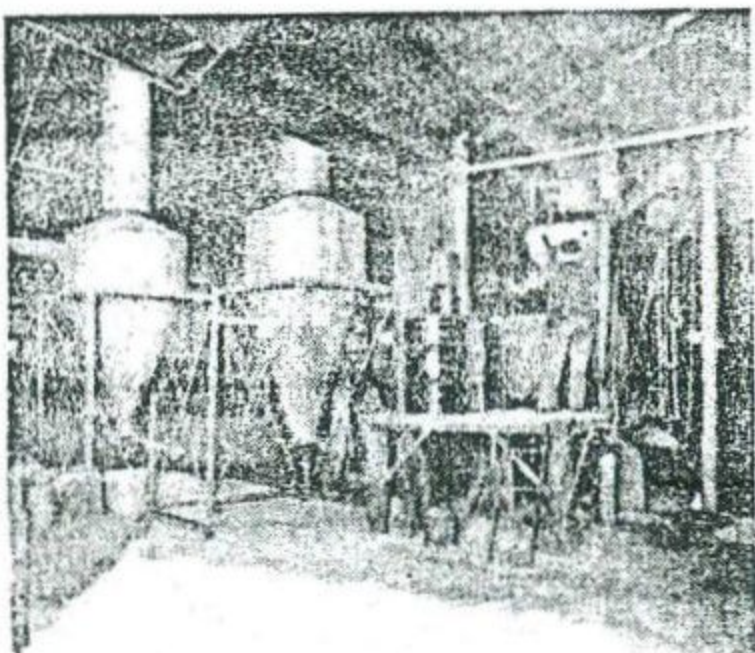
The immediate post-war years saw the factory endeavouring to overcome severe shortages of basic materials in an effort to supply the tremendous demand for all types of agricultural machinery. At the same time, the necessity for long-term planning was not lost sight of, and a special research and development Department was instituted, while senior technicians were sent overseas to study the latest methods and advancement in machinery and tool design.

As a result, a number of new cultivation implements have been

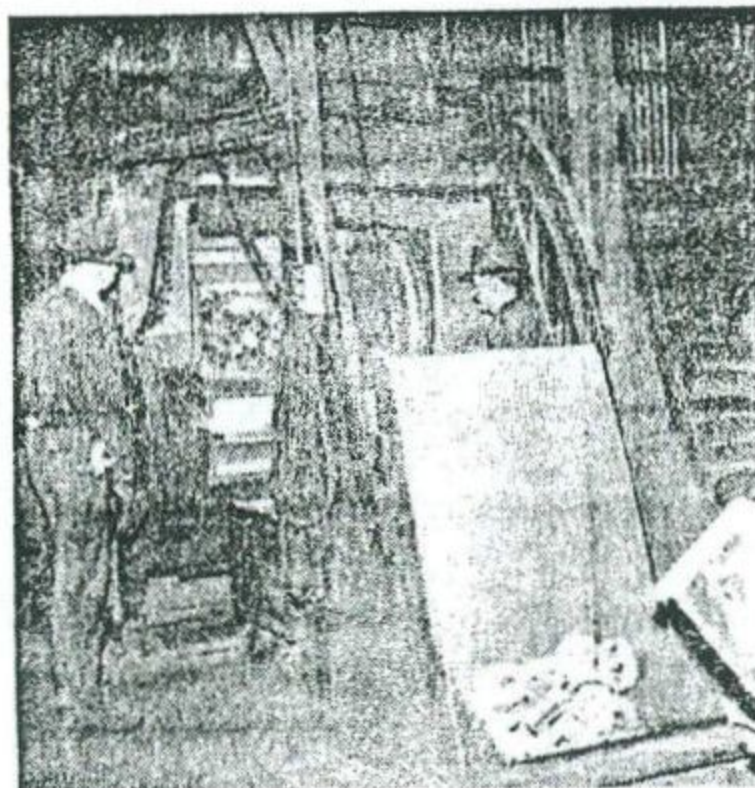
introduced and a new field—that of industrial engines and power units—successfully developed.

The Howard "A" Series Trailing Rotary Hoe, first introduced to the Public at the Royal Sydney Agricultural Show in 1950, opened up a new field for large scale general cultivation with a rotary tillage implement designed for use behind the farmer's own tractor. Made in five widths of cut, from 5 ft. to 9 ft., this trailing Rotary Hoe has already proved its value not only for wheat and general farming, but also as a means for effective pasture improvement and land reclamation.

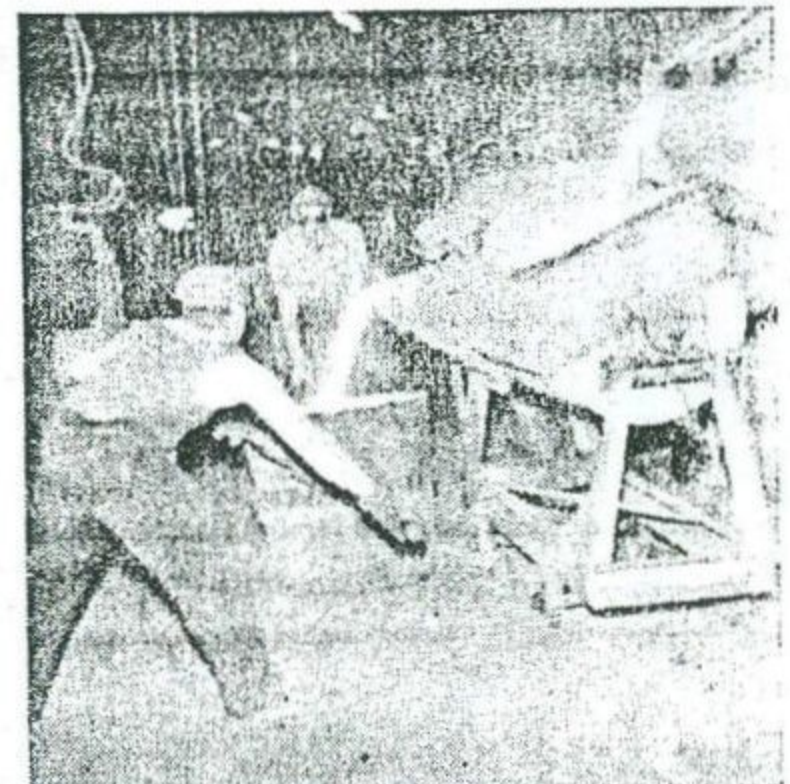
A 37 b.h.p. tractor-rotary hoe unit, the Howard "DH226" has replaced the DH22, and a very popular newcomer has been the 4.2 h.p. "Terrier" rotary hoe with its wide range of attachments such as sickle mower, spray and dusting outfits, trailer, tool bar, etc., while other new developments of special importance to the man on the land are due for release in the very near future. The growing world interest in rotary tillage may be gathered from the fact that the Howard range of rotary hoes and tractors



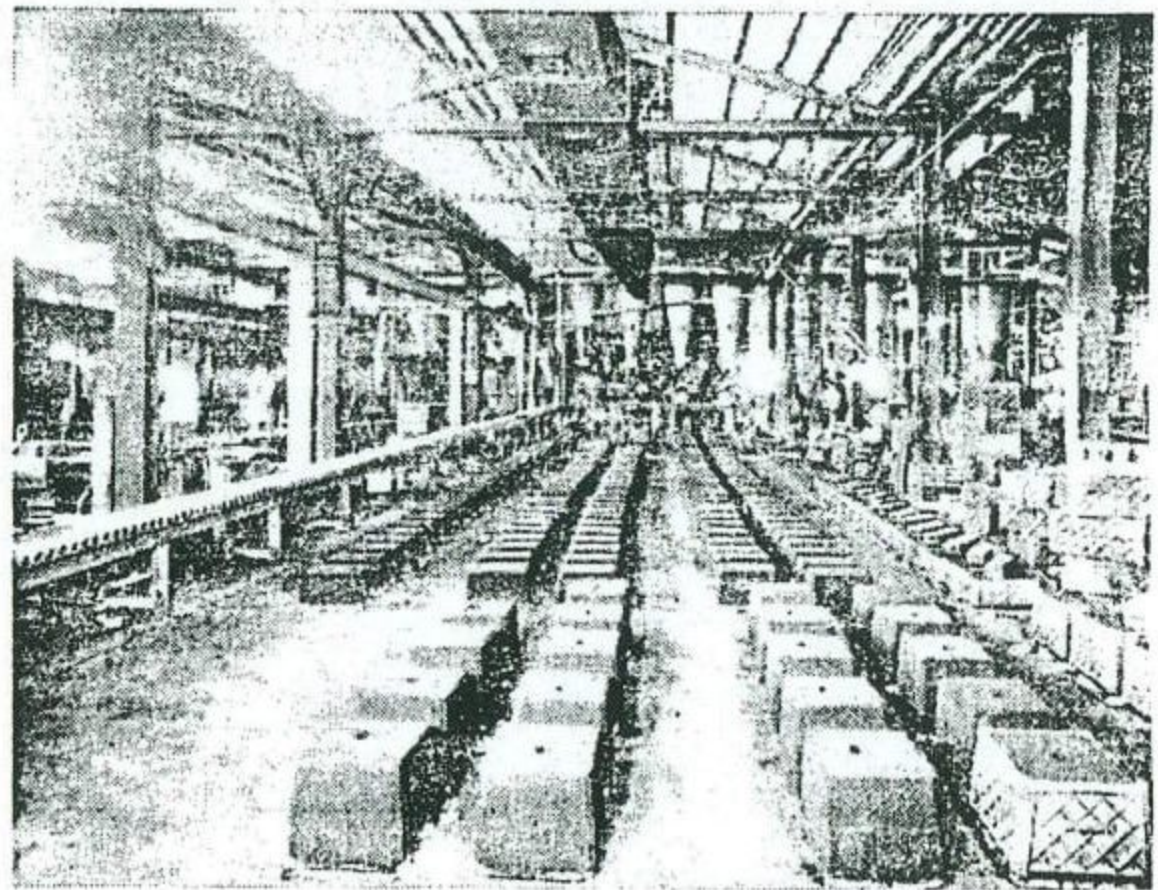
Part of foundry sand drying equipment. Sand drier and core sand mixing mill in background; conveyor on left.



Wheelabrating machine used for cleaning off adhering sand from raw castings by means of chilled grit or shot impinged down from hollow spindle impeller in top housing.



Filling ball ladle from receiving ladle.



(Above) Aerial view of Howard Auto-Cultivators Ltd.'s factory at Northmead, N.S.W. (Right) General view in Foundry of pouring area prior to casting. Moulds are from jar squeeze machines.

The Story of Howard Auto-cultivators

Thirty Years of Industrial Progress Closely Linked to Australia's Primary Production

The story of Howard Auto-Cultivators Ltd. dates back from 1923 when A. C. Howard, son of a Gilgandra (N.S.W.) farmer, set up business with three employees in a 40 ft. x 20 ft. wheelwright's shop at Moss Vale, N.S.W. To-day the company's high standards of production, coupled with constant investigation and testing in the field, have enabled it to provide farmers with implements of stability, reliability and ruggedness, and after 30 years' experience in this exacting field, the company feels that it has contributed some degree of progress to the mechanisation of agriculture, both in Australia and overseas.

LONG before 1923, young Howard had been working out details of a soil tillage implement using the revolutionary principle of a rotor with special blades attached, which, mechanically propelled, could be rotated at speed so that each blade would slice out pieces of earth and throw them to the rear. Control of the speed of the rotor and the travel speed of the unit would alter the length of cut, a depth control wheel would govern the depth of the "bite", while width of the rotor would corres-

pond with the amount of soil to be worked in one operation. By these means the degree of soil tillth from fine to coarse could be selected at will by the operator, while any surface growth could be disposed of at the same time.

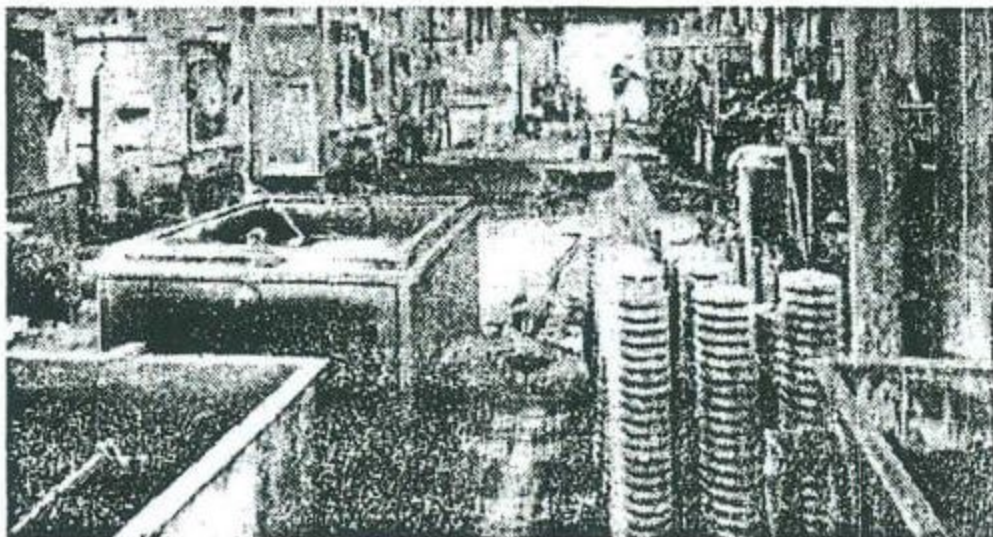
Thus, the idea of rotary tillage was conceived, and as at that time much virgin land was being converted into wheat farms, a suitable machine for this type of cultivation became the first project of Austral Auto-Cultivators Ltd., as the new firm was then called. The

first order was received on January 19, 1923, from a wheat-growing Doctor in the West.

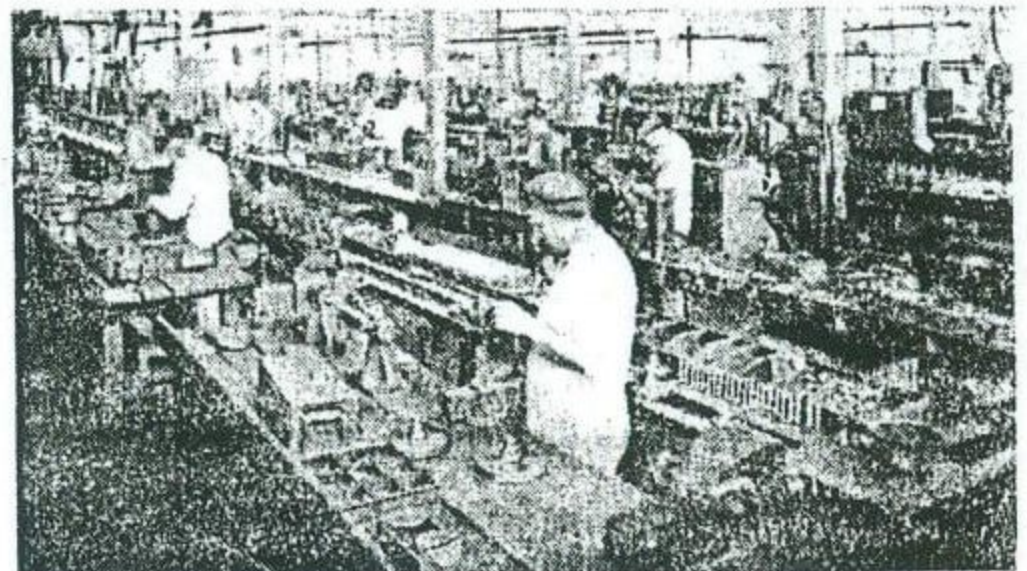
Designed for level wheat paddocks, the rotary hoe was built in three sections with a total cutting width of 13 ft. 6 ins.; the two outer sections being made to raise vertically to negotiate gateways, and power being supplied by a 60 h.p. Buda engine. The market for such a cumbersome machine was obviously limited, but the work it did was sufficient to indicate the po-

tentials for smaller machinery with a more universal application.

As a result, two new implements were developed, one with a 24 in. width of cut powered by a 3½ h.p. Sturmev Archer engine, the other with a 4 ft. 6 in. width of cut and a 16 h.p. Morris Commercial engine. At the same time, a rotary hoe attachment was designed for use with the Fordson tractor, the first going to a well-known orchardist in the Gosford District in N.S.W.



View of Heat Treatment Shop.



Section of Assembly Department at Northmead.

are in use not only throughout Australia and New Zealand, but in Africa, India, Ceylon, the Mediterranean, the West Indies, South America, Mauritius, New Guinea, Berneo, Hawaii and Fiji.

The successful development of transmissions and power units for these sturdy agricultural machines opened the way for entry into the quantity production, engine-making



Mould being filled from overhead hopper on pin lift machine in Howard Auto Foundry.

field, and a special new Engine Shop was built and equipped for this purpose.

The first unit produced was the "A" Series Heavy Duty four-cylinder, O.H.V. 45 b.h.p. engine incorporating features such as Molybdenum chromium steel valve seat inserts and removable wet sleeve liners. This has been followed by two "L" series single-cylinder air-cooled engines of the light-weight, high output type, developing 4 and 5 h.p.

To-day, Howard Auto-Cultivators

Ltd. have a self-contained plant covering some eight of the nineteen acres owned by the Company at Northmead, their fixed assets having a value in excess of one million pounds. A notable feature of the factory is that, with the exception of spark plugs, ball races, piston rings, magnetos, radiator cores, rubber hose and tyres, the entire range of products, including engines, is fabricated at Northmead.

The Foundry has a staff of 90 and is equipped with such modern methods as laboratory control of all raw materials, sand conditioning, and a range of moulding machines from 250 lbs. jar squeeze to 1,500 lbs. roll over. Core-making is taken care of by core sand drying and core blowing machines, and ovens under close temperature control, rack loaded, and fitted with doors on each side. The core-making section operates dry sand from hopper straight into a 6 ft. Simpson mill through normal methods of various mixes depending on where the cores are to be used. Equipment, such as box parts and binders, was imported from the U.S.A., and is of the highest standards. Pattern equipment is mostly metal patterns, and a great deal of this precision work is carried out in the factory Tool Room. The industry, particularly internal engine production, calls for close control in all phases of foundry activity, and to meet these rigid conditions there is a half-hourly test on all sand, and flow inspection, by the Chief Inspector, as separate from foundry supervision in all other phases. A 42 in. cupola fitted with air-weight control balanced blast, and the various alloy irons used, are supervised by the Chief Metallurgist. A normal day's run is approximately 18 tons of castings. Cleaning, dressing, and general fettling follow the pattern of wheelabrating, inspection, dressing, and protective painting of all cast-

ings where surfaces are exposed to gears or any other moving parts as met with in transmission work on internal combustion engines.

The Forging Department uses forging hammers up to 2,200 lbs. capacity, and is mainly engaged on lighter type forgings for transmission work and internal combustion engine components.

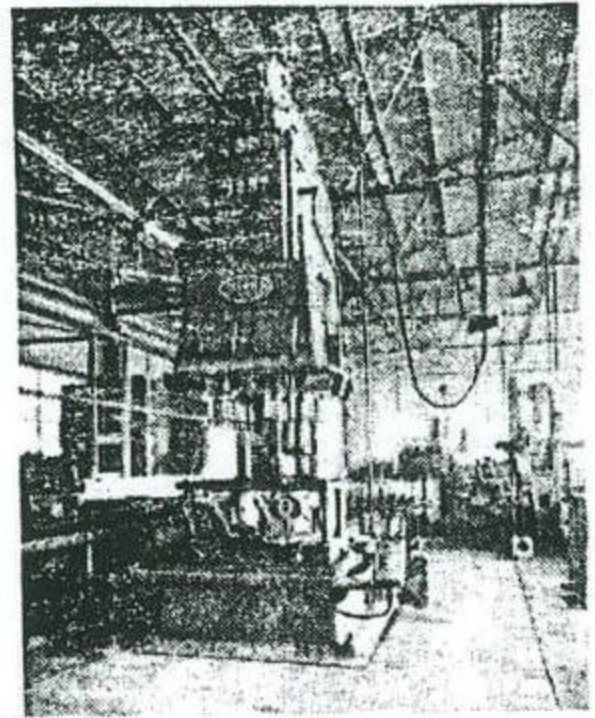
The Heat Treatment Department is equipped with a battery of eighteen different types of furnaces which take the work through the processes of liquid carburising, salt bath tempering and all normal heat treatment normalising and annealing operations associated with the Company's industry. Pyrometry is installed in all furnaces and is master checked twice each year by National Standard Laboratories.

The Company has 20 men on welding processes covering oxy-cutting and electric brazing in all phases. Commonwealth Industrial Gases Ltd. have installed a liquid oxygen plant from which oxygen is piped to five departments under a highly efficient reticulation system, resulting in considerable decentralisation of welding activity and reducing handling costs very considerably.

The Machine Shop contains some 200 machines for high precision, medium type engineering, most of this plant having been installed during the past five years.

The Engine Shop caters for machinery requirements in two broad categories—general machinery and engine building. Here some 150 engines are machined and assembled per week, machine tools of automatic and multi types being used for turning, drilling, boring and milling.

The Sheet Metal Shop uses presses of from 20 to 250 tons capacity, and is entirely self-contained, and capable of producing



48-spindle multi-head drill in Howard Auto-Cultivators Engine Shop.

many manufactures in sheet metal from fuel tanks, engine cowls, fenders and radiator cowls, to heavy pressed work where dies up to 4 ton are employed.

The Tool Room is equipped with modern tools and its 65 men are called upon to manufacture jigs, tools and dies for tractor and engine production.

Work from all manufacturing departments goes through the Stores to the Assembly Section where the various model rotary hoes and tractors follow the straight line pattern of assembly so well known in present day methods.

All departmental activities at Howards, right through to the Despatch Department, are supervised by a rigid inspection set-up which, in turn, controls all standards of measurement, gauging, and tool inspection, through the Metrology Section.