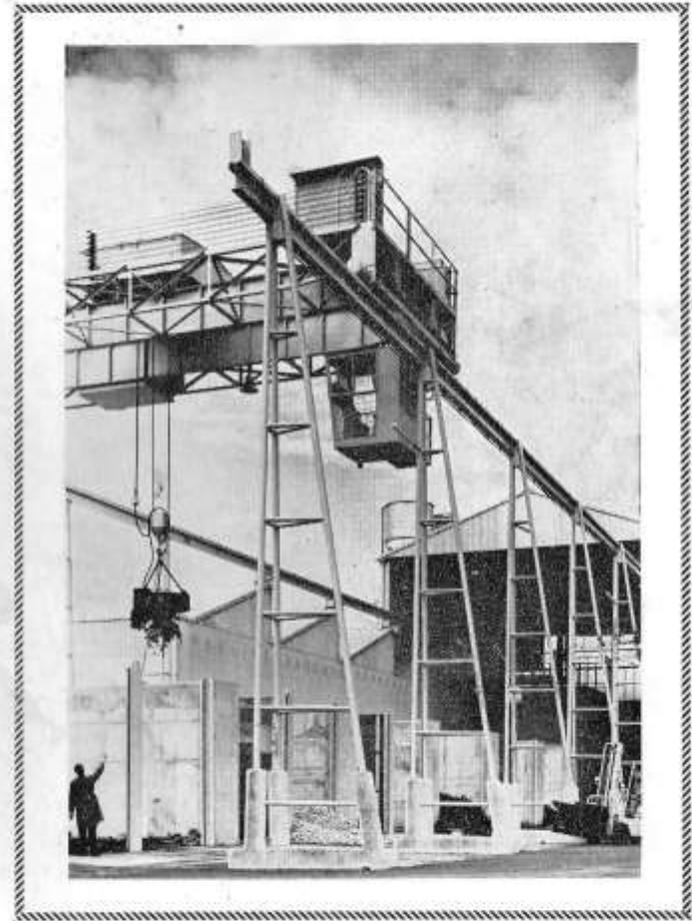
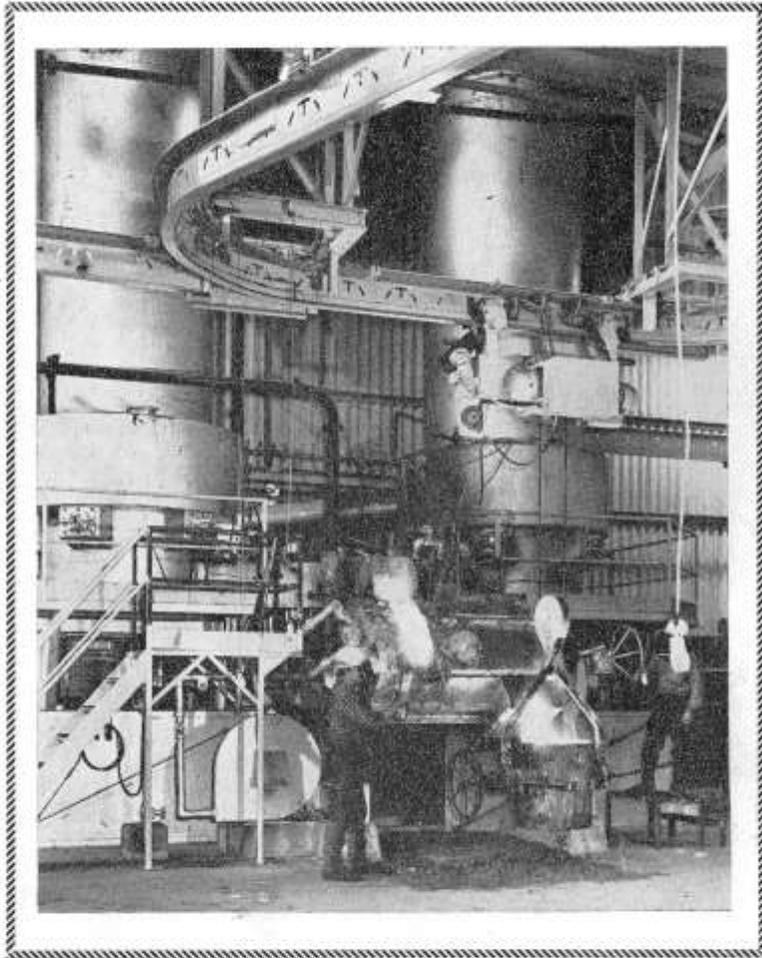


Massey-Ferguson
(Australia) Limited



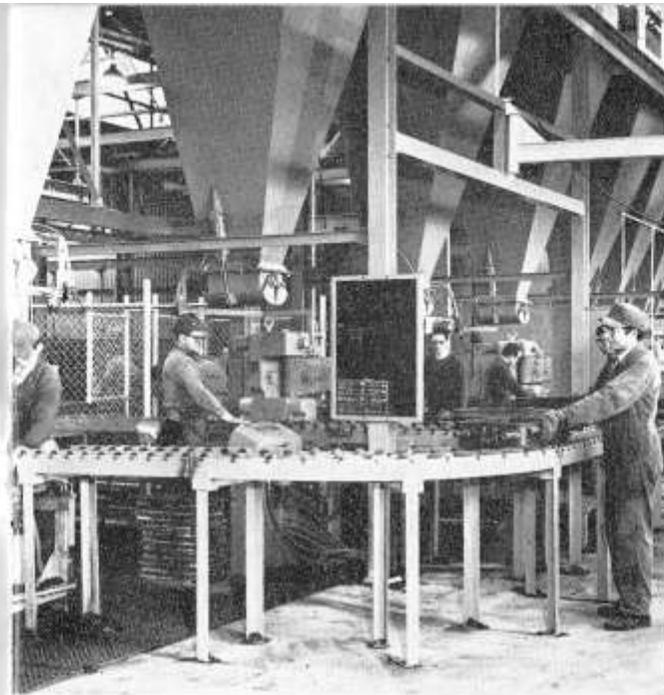
**WELCOME
TO SUNSHINE**

Meantime, Massey-Harris had amalgamated (1953) with Harry Ferguson, inventor of the world-famous Ferguson System; the Company name was changed to Massey-Ferguson in 1958. The Ferguson System of tractor and implement integration revolutionised post-war farm mechanisation and the 100,000th Ferguson System tractor to reach Australia was presented to the University of Melbourne Mount Derrimut Field Station in November, 1964. Most of the MF tractors sold in Australia are produced at the Company's Coventry (UK) plant, where output is up to 400 units daily.

Massey-Ferguson (Australia) Limited has branch offices in all State capitals which control a national network of 340 dealers and sub-dealers. As well as serving the requirements of Australian primary producers, the Company exports locally manufactured machinery to 80 countries. Massey-Ferguson entered the industrial and construction machinery market in 1960. The ICM range of wheel and crawler tractors, with attached diggers, loaders, dozers and rippers, has been broadened progressively. Some of the industrial attachments for imported tractors are produced at the Company's Bendigo plant, which also manufactures spare parts for non-current machines. A subsidiary company, Crichton Industries Pty. Ltd., of Bundaberg (Queensland) produces Crichton cane harvesters and miscellaneous cane farming equipment.



Transported by overhead conveyors from foundry cupolas to the casting section, molten metal is poured into assembled moulds.



In MF's modern foundry a roller conveyor leads "boxes" to a bank of automatic mould-making machines.

CHAIN MAKING

A unique giant press, designed and built by Company engineers, cuts and rolls the sprocket chain for all Massey-Ferguson machines — and for other industries in Australia and overseas. Strip steel is fed from coils into the press and comes out as an endless chain. A link of the chain is formed with each stroke of the press and these links are automatically advanced and joined. There is no waste material. Heat treatment gives the chain remarkable strength, and it can be broken into lengths for power drives, elevators and other uses simply by disconnecting a link.

BRIGHT STEEL DEPARTMENT

The cold drawing process for bright steel shafting was introduced into Australia by the Company in 1917. Black iron up to 2½ in. diameter is first immersed in a heated solution of sulphuric acid and water to remove mill scale and rust. The bars are then drawn through tungsten carbide or hard chromium dies, a single pass reducing the diameter by up to 1-16th in. and giving the bright finish and close tolerance



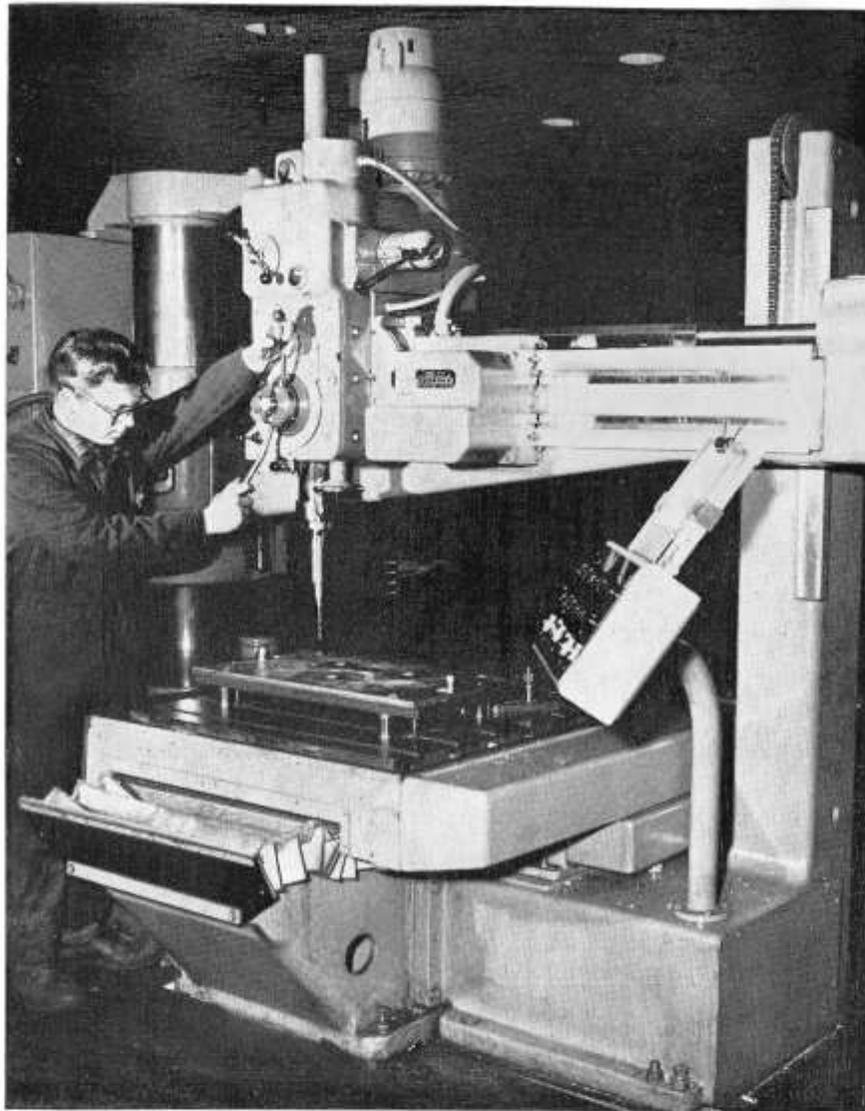
Massey-Ferguson (Australia) Limited, largest farm machinery manufacturer in the southern hemisphere, combines the traditions and activities of the former H. V. McKay, Massey-Harris and Harry Ferguson businesses in Australia. The Company is a subsidiary of the Toronto-based Massey-Ferguson Limited, world's leading producer of agricultural tractors, grain harvesting machinery, lightweight diesel engines (Perkins) and sugar cane harvesting equipment.

The world-wide MF organisation's annual sales exceed \$900 million. It has 37 manufacturing plants on five continents, markets its products in 165 countries and employs more than 46,000 people. Genesis of MF's Australian operation was the invention of the stripper harvester by Hugh McKay in 1884. The machine developed by McKay at Drummartin (Vic.) was the first to combine the functions of reaping, threshing and winnowing grain from the standing crop.

McKay established a manufacturing base at Ballarat but purchased the Braybrook Implement Works in 1904 and two years later transferred his manufacture to Braybrook Junction, renamed Sunshine in 1907 after the brand name of the harvester. The "Sunshine" registered trade name still appears on all Massey-Ferguson headers and drills produced at the 76-acre plant, which has 1.4 million square feet of productive floor space and is the second-largest in the world-wide MF manufacturing chain.

Massey and Harris farm equipment from Canada was sold in Australia before the two Toronto firms merged to form the famous Massey-Harris company in 1891. Subsequently Massey-Harris established branch and agency distribution throughout Australia. The McKay and Massey-Harris companies first came together in 1930 when tariff barriers were raised against the importation of machinery and a solution to the Canadian company's dilemma was to enter into an agreement with the McKay organisation.

This agreement, effective for 25 years, gave the McKay company exclusive distribution in Australia of Massey-Harris products. In return, Massey-Harris obtained a minority shareholding in the renamed H. V. McKay Massey Harris company. On expiration of this contract the remaining McKay shares were sold to the Toronto firm (February 1955). The Sunshine organisation thus became a subsidiary.



Top : Dial a program on this numerical control drill and it automatically positions itself for drilling templates or punch plates without marking.

Front cover : Foundry raw materials stored in bins are delivered to the cupolas by overhead crane.

Back cover : Molten metal drawn from the cupolas is transferred by overhead conveyor to the foundry's casting section.



The Huon milling machine is a unit particularly adapted for tooling and maintenance work. The movable head with cutter that can be mounted at any angle, allows most faces of any component to be milled from one position on the table.

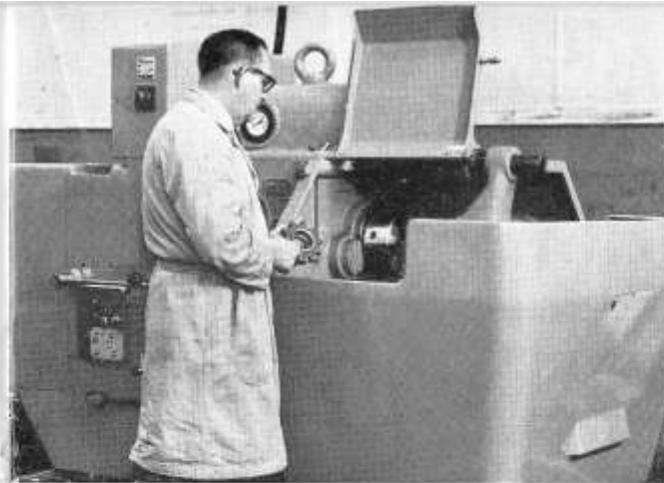
required. Soap powder is used as a lubricant. The bars then pass into "reeling" machines which ensure straightness. Larger bars of up to 4½ in. in diameter are "reeled" then turned in special lathes to specific size and finish and "reeled" again. Massey-Ferguson also provides "bright rounds" for other industries and for export.

HEAT TREATMENT

Many components of Massey-Ferguson products are treated by heat to improve their strength, hardness and ductility. Parts are heated in furnaces or salt baths to temperatures above 750 deg. centigrade and are then quenched in oil, brine or water. This leaves metal hard, but brittle. The components are again heated to between 200 and 600 deg. centigrade, which softens the metal slightly and produces the necessary toughness to withstand shock. Other parts require a hard-wearing surface while still retaining a strong core. The carbon content of the outer surface of these components is increased in a cyanide bath, a gas carbonising furnace or in charcoal packs. They are then reheated and quenched and toughened in the same manner as ordinary heat-treated steels.

TOOL ROOM

All the jigs, dies, tools, and the wood and plate patterns required for the thousands of farm implement parts manufactured at Sunshine are made in the plant Tool Room. Modern farm machinery is engineered to close tolerances and the equipment in the Sunshine tool room meets the highest standards in the industry. The trend in the tool room is towards the use of numerical or tape controlled machine tools for "one off" production. A French GSP numerical control drill automatically positions itself, after dialling selection, for drilling and boring, thereby obviating the marking out of templates and punch plates on a surface table. It is accurate to within .001 in. Components requiring greater accuracy are processed on either of two jig borers capable of co-ordinating dimensions to .0001 in. The more modern of these two

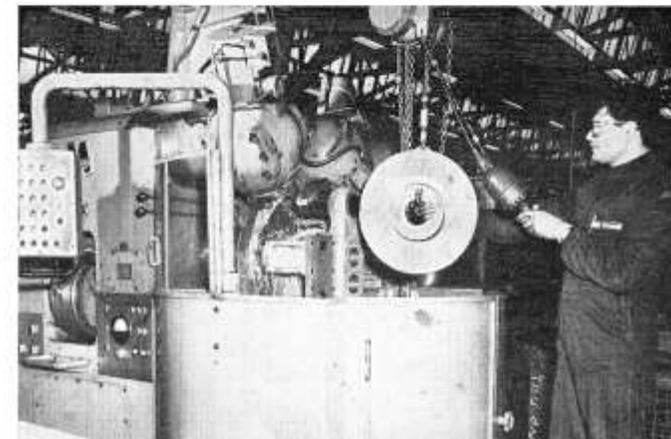


The Montforts automatic chucking lathe differs from the normal lathe with bed, head stock and turret in that the bed is eliminated and the tools are carried in a vertical turret.

machines cost \$40,000. Steel rule dies are used whenever the cost of conventional blanking dies is not justified by volume production. Steel rule dies can be made more quickly and at about a third of the cost. Tool room technicians maintain all manufacturing equipment, sharpen cutting tools, re-tip and diamond lap tungsten carbide tools.

FOUNDRY

Commissioned in August 1967, the Foundry is designed for a daily output of approximately 40 tons of various types of iron and steel castings. The iron is produced in cupolas which are charged with a balanced proportion of coke, limestone, pig iron, scrap steel and iron. Steel is made in a triple high frequency induction electric furnace of three-ton capacity. This furnace also produces malleable and nodular iron. After mulling, the sand is carried on overhead conveyors to sand hoppers situated at the moulding stations. The modern moulding machines installed in the Foundry are the British CK, BQ1 and BQ3 automatic moulding machines and two American BQ1 automatic



This is a smaller version of the Montforts lathe. Its design minimises thermal and mechanical distortion thus producing more accurate work.

wheel can be bored while the outer portion is being profiled. Where economically feasible, automatic machine tools are installed to facilitate low-cost batch production. Illustrating this trend is the Montforts automatic chucking lathe. This differs from the normal concept of lathe with bed, head stock and turret in that the bed is eliminated. The tools are carried on a cruciform-type turret mounted directly into the head stock. This minimises thermal and mechanical distortion and produces more accurate work. Numerical control machine tools have particular application in the machine shop for batch production work.

SHEET IRON

The Sheet Iron Shop processes various gauges of flat iron into a variety of shapes and sizes. Machinery includes guillotines up to nine feet long, presses capable of exerting pressures up to 500 tons, riveting, punching and bending equipment. Among the components made in this department are header fronts, grain tanks, straw walker casings, auger conveyors, threshing drums, seed drill hoppers and cane harvester casings and panels.

WOODMILL

The Woodmill is primarily concerned with the manufacture of various wooden parts for use in the production of machines and implements. An equally important function is the manufacture of cases and crates for shipment of products. The Woodmill uses nearly a million super feet of timber annually.

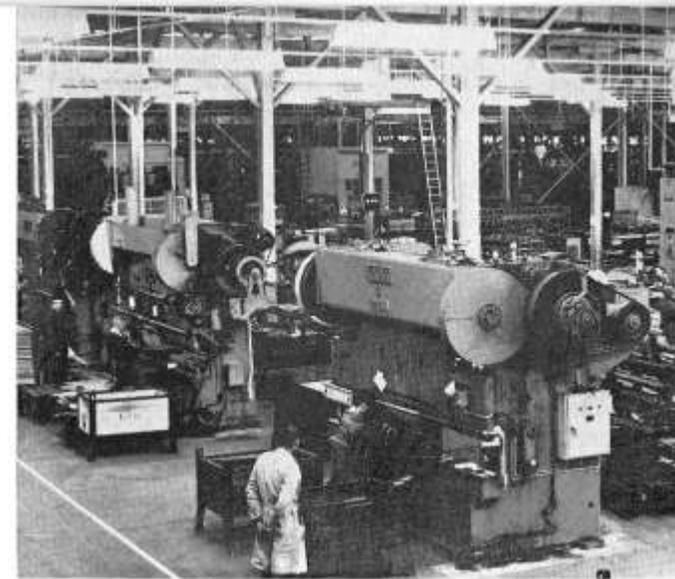
ASSEMBLY

The Assembly Section is a scene of constant and varied activity. The products of all the prior manufacturing processes are brought together under their respective machine groupings — headers, drills, planters, disc ploughs, rakes, spinner broadcasters. Sub-assemblies are carried out in bays adjoining the main assembly line. These and other components are then fitted as the machine passes down the main conveyor belt. There is an adjacent assembly line for tractor linkage mounted implements. Following assembly, machines and implements are thoroughly checked before going on to the spray painting booth. After leaving the drying ovens, they then receive another rigid inspection before going to the despatch area. The No. 2 Assembly Section, situated near the despatch area, is utilised mainly for the assembly of a variety of small implements and header fronts.

When a new product is being made or major features incorporated in an existing product, technical and product specialists thoroughly check the first unit off the line.



Presses capable of exerting pressures of up to 500 tons are an essential part of an extensive range of Sheet Iron Shop equipment that cuts, rivets, punches and bends sheet iron into a variety of shapes and sizes.



ENAMELLING

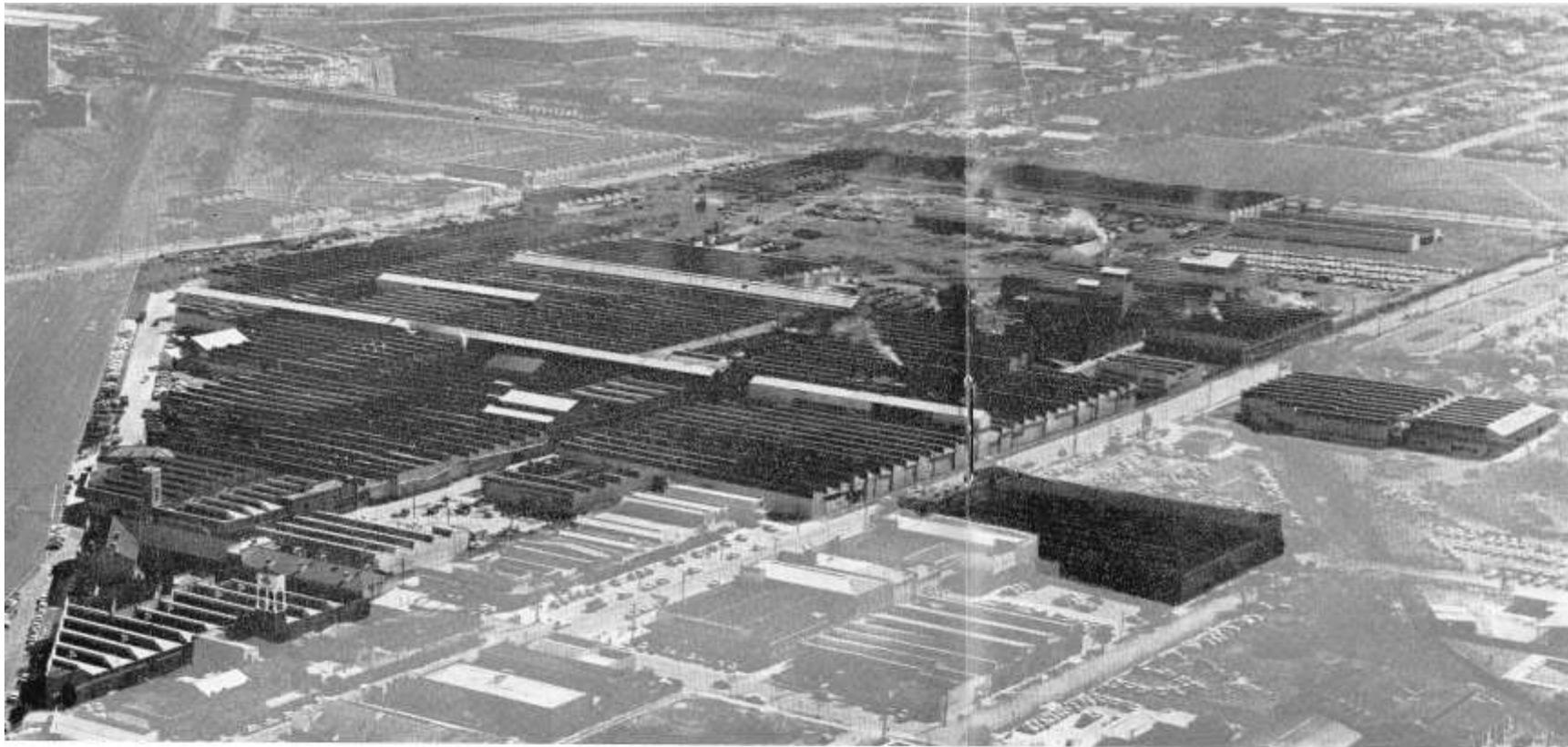
Constant technical research ensures that the "finish" of all machinery reflects the advanced engineering design, functional efficiency and durability that is inherent in Massey-Ferguson products. Almost every component produced at Sunshine passes along the automatic enamel dipping line. The parts first receive a high velocity spray of heated detergent which removes all rust, dirt and oil. After a hot water rinse, the parts are "passivated" with chromic acid solution which prevents rust forming before passing through the drying section to the dip baths. Components receive an anti-corrosive priming enamel and are baked in thermostatically controlled ovens. From there, the parts either go to the assembly line or are passed through the "finish" enamel dip. Assembled machines and implements are rubbed down before receiving an enamel coating by the airless electrostatic spray painting process. Finally the machines go into a drying oven where the high quality enamel is baked on to provide a lustrous finish.

STEEL STORAGE

About 15,000 tons of steel of more than 1800 varieties are issued annually from Massey-Ferguson's steel store. There are three storage areas in the factory. The main store can accommodate 10,000 tons of steel and is serviced by a two-ton overhead electric transporter which travels on a runway 550 feet long. Steel can be admitted to the plant at the rate of 240 tons a day; issue to the factory averages about 65 tons daily.

DESPATCH

It is the aim of the Despatch Department to ensure that machinery and equipment reach their destination in the condition they passed the final inspection. This department is served by two cranes of three-ton and five-ton capacities which load direct into road transports and railway trucks. Special frames, crates and attachments are used to support machines and to eliminate movement during transit.



The Sunshine factory, pictured from the air, is the second largest in the world-wide Massey-Ferguson manufacturing chain. The two buildings to the right of the main manufacturing block house the MF Australian Central Parts Operation and the Woodmill. Melbourne Branch has its offices and warehouse in the building near the top of the picture.

machines which will produce approximately 120 moulds per hour. American SPO jolt pin lift machines are used for large castings such as wheel weights. When the moulds have been poured, the castings and sand travel along an underground oscillating conveyor to a shakeout. Here the sand is separated and returned to the mulling section and castings are sorted for further operations.

OXY CUTTING

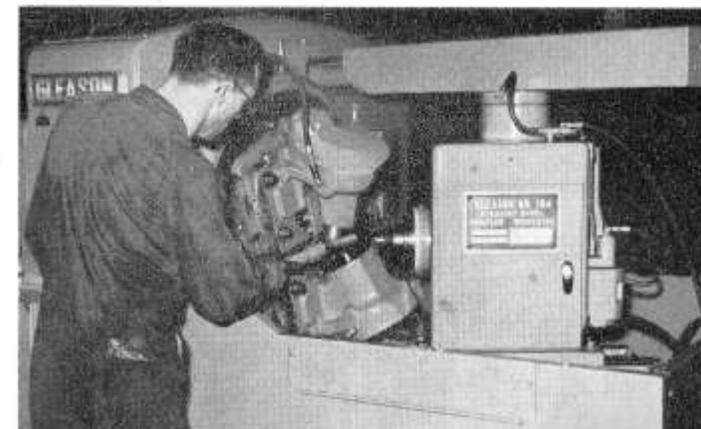
Due to size or design, many parts used in the manufacture of Massey-Ferguson products cannot be processed on lathes, presses, guillotines or other machines. Instead, oxy-cutting techniques using high temperature flames of oxygen and acetylene or propane are used. Steel plate or angle iron is processed either by machine or by hand. Profile machines follow a master pattern which is reproduced perfectly in the shape of the part being cut. In many instances it is more practical to use this method than to make an expensive blanking die.

CUTTING-UP SHOP

The Cutting-up Shop handles iron bars 20 ft. long and steel plates of up to 12 ft. by 4 ft. and $\frac{1}{2}$ in. thick. Machines are arranged in two lines. The first line of machines cuts, slots, and punches holes in iron bars and reduces steel plate to strips. Machines in the second line cut the metal to shape with special dies and trim radii.

MACHINE SHOP

The Massey-Ferguson machine shop is one of the biggest and best equipped in Australia. There are about 200 machines in this department for turning, milling, gear cutting, drilling and grinding. Parts are machined to MF specifications, some requiring close tolerances and a high degree of surface finish. Of special interest among a battery of precision machines is the Gleason gear generator — or straight bevel coniflex generator. A rotary cutter, it produces a complete gear in one cycle and is five times faster than its reciprocating-type predecessor. A Pensotti vertical boring machine has an hydraulic attachment that copies profiles from a flat template. A component such as a tractor



MF was the first company in Australia to instal this type of Gleason gear generator. It produces a complete gear in one cycle.



Quality Control uses highly sensitive equipment to regularly check the accuracy of gauges and measuring devices used in manufacturing processes.

QUALITY CONTROL

The Quality Control section carries out the following major functions:—

- Inspects all manufactured components and purchased parts to ensure they meet engineering specifications.
- Controls all metallurgical and chemical processes used within the plant and by outside contractors.
- Evaluates the field performance of all products to ensure that necessary improvements are incorporated.
- Controls the accuracy of all gauges and measuring devices used by Company employees. This is achieved in the standards room, which meets the exacting requirements of the National Association Of Testing Authorities.

APPRENTICE TRAINING SCHOOL

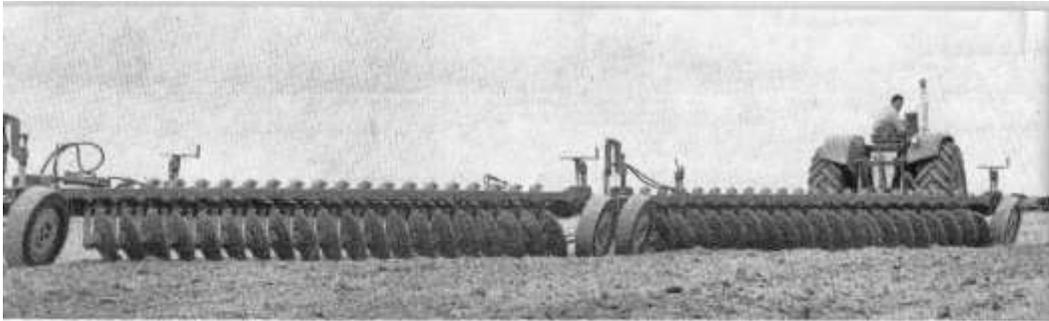
A modern apprentice training school was opened in January 1967. The school is designed to cater for 30 first-year fitting and turning apprentices. Its spacious workshop is equipped with centre lathes, milling and shaping machines, cylindrical and surface grinders, drilling machines, band saw, press, tool and cutter grinder and benches for the fitting operations. Provision has been made for the subsequent inclusion of heat treatment and welding facilities.

MF's modern apprentice training school is equipped with all the facilities and amenities for 30 first-year fitting and turning apprentices.

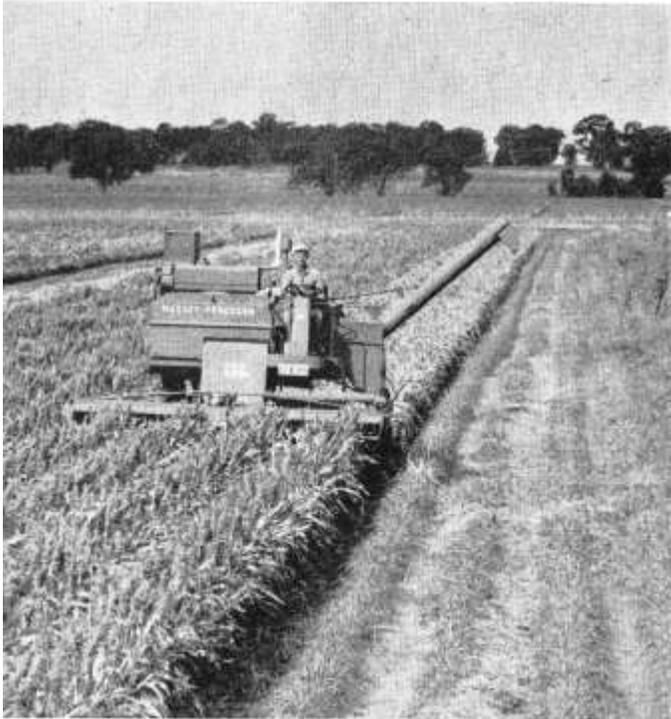


WHAT WE MAKE

Planting Equipment—	Drill-Cultivators Disc Drills Toolbar Planters Spinner Broadcasters
Ploughs—	Mounted Disc Ploughs " Mouldboard Ploughs
Tillage—	Broadacre Cultivators Broadacre Scarifiers Sundercut Disc Cultivators Disc Harrows Covering Harrows Stump Jump Harrows Mounted Toolbar equipment
Foraging Machinery—	Hay Balers Bale Loaders Mowers Side Delivery Rakes Forage Harvesters Fingerwheel Rakes
Grain Harvesting Machinery—	Power take-off Headers Self-propelled Headers
Miscellaneous—	Sugar Cane Harvesters Post Hole Diggers Jib Cranes Transporters Earth Scoops Cordwood Saws Multi-Purpose Blades Subsoilers Loaders
Non-Agricultural—	Steel Sprocket Chain Bright Steel Shafting



Top: An MF 1100 Tractor, manufactured in North America, hauls two MF 67 20-disc Sundercuts in W. A. Sundercuts, first developed at Sunshine in 1916, have opened up millions of acres of Australian wheat country. The modern version is still popular for breaking up virgin ground and primary cultivation.



Left: An MF 585 SP Header harvests sudax seed in N.S.W. The 585's versatility enables it to harvest a wide range of small seeds as well as grain.

Below: Up to 300 bales an hour were being produced by this MF 12 Baler on a N. S. W. irrigation farm. The tractor is the MF 165.



A 50-foot conveyor feeds measured quantities of cereal crop into MF's unique grain threshing apparatus. The rig comprises orthodox header components. Conditions can be varied at will to fully test the reaction to changes in dimensions or positioning of individual components.



Left: Many Australian broadacre farmers use a scarifier for primary cultivation instead of a plough. The MF 120 Trailed Scarifier range is designed for both primary and secondary cultivation. This is a 25-tine model behind an MF 1100 Tractor.

Below: MF Product and Sales Training Department has 250 acres of land, a 7,200 sq. ft. building and a team of specialists to provide sales and service training for personnel from MF dealerships.

