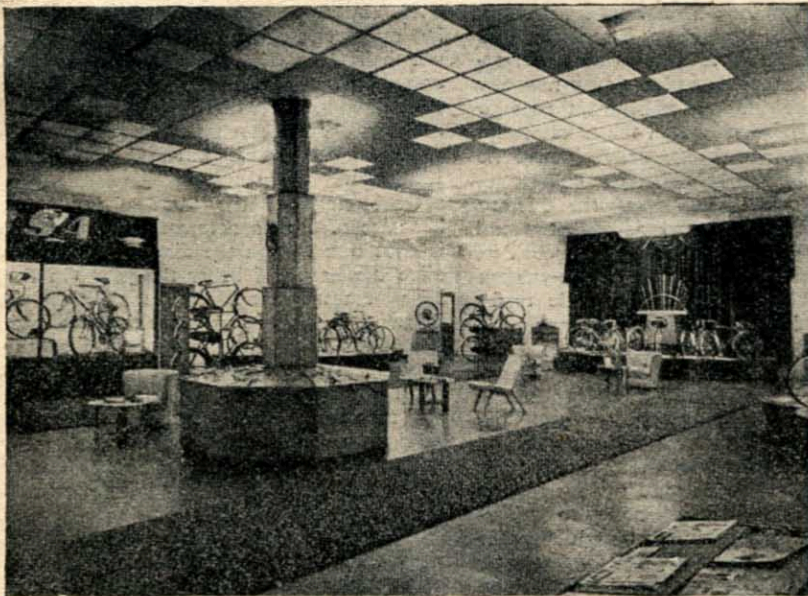
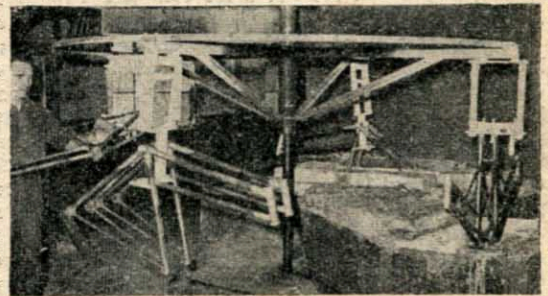


DESIGNED FOR PRODUCTION



(Left) A general view of the Waverley Works Showroom. (Right) The automatic rotary brazing hearth.

Used Exclusively for the Production of B.S.A., New Hudson and Sunbeam Bicycles, the Reconstructed B.S.A. Waverley Works Organization is Described Here by NIMROD



THE reconstruction of the war-damaged B.S.A. Waverley Works, on the main road from Birmingham to Coventry, has provided a basis for a complete reorganization of the company's cycle production. All the bicycles in the B.S.A., New Hudson and Sunbeam ranges are now produced entirely in the extensive Waverley Works, where an output of 7,000 to 8,000 machines a week can already be reached. The concentration of the various manufacturing processes in the one works has obvious advantages, particularly in this case, where, starting, as it were, from scratch, the works have been designed specifically for cycle production and where careful planning has resulted in what must be one of the neatest production lines in the country.

I recently had an opportunity of touring these works and watching the bicycles under construction growing from lengths of tubing into smart, finished machines ready to receive their owners' approval.

The planning was evident right from the outset, for even the frame tubing is obtained from the manufacturers in lengths suitable for finishing exactly to the various sizes required, thereby avoiding wastage.

After shaping, the tube lengths are passed into the frame shop, which is, incidentally, the only part of the original building still remaining. The necessary lugs, fork crowns and other frame items are issued, and the first building process commences with the electronic butt welding of the pump pegs to the seat tube. The frame is then built loosely, with the tubes inserted in the lugs, which are "dimpled" by compressed air, instead of "pegging," to hold the assembly in position.

The first part of the frame to be brazed is the head assembly, after which the other joints are made secure on a rotary hearth, where the frames are automatically pre-heated and then dipped in the brazing fluid, timing for all the processes being governed by the rotary machinery.

After de-brassing, the head is then machined to size and the bottom bracket and seat lug bores are reamed.

Then comes the first of many tests that the frame will undergo before it is completed, the brazed assembly being tested in three jigs to ensure complete accuracy of building. A fourth jig is employed to hold the frame firmly while the rear fork ends are cut out by machine in one stamping operation.

This completes the building of the frame and then follows the several processes to ensure a good basis for a first-class finish. After shot blasting to remove borax and scale, the frame tubes are polished on emery wheels, and hand filing of the lugs gives the final touches before enamelling.

At this stage expert viewers examine every frame for visual blemishes and dimensional faults.

Meanwhile, the fork assembly has

been going through a similar process. The fork columns have been set and pegged in the crown, fork blades mitred and the strengthening liners inserted, the whole assembly being brazed in a heating unit called a fork "muffle."

The enamelling shop in the B.S.A. works is justifiably a source of pride to the company, with scientifically controlled plant ensuring a consistent standard. The huge vats of enamels are constantly being cleansed, whilst controlling all operations and making frequent tests of equipment and materials are the scientists from the company's laboratories. All the frames are first Spr-Bonderized by one of the most modern plants in the country before the various high-lustre finishes are applied.

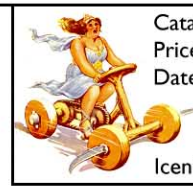
Parallel to the enamelling processes is the plating plant, again fully automatic and incorporating the most modern system. This is one section of bicycle manufacturing where the danger of "more haste less speed" is avoided and in the B.S.A. works plated items go through 15 stages. These are, in sequence: polishing, electrolytic cleaning, washing, etch, wash, second etch, wash, nickel plating, two cold washes, chromium plating, three cold washes, one hot wash.

The frame is now complete apart from one further operation when the bottom bracket is tapped. The placing of this operation after enamelling is perhaps somewhat unusual but it has been found that if the bottom bracket threads were cut before enamelling a further process is needed to clear the surplus enamel from the threads.

The "home-made" device used for tyre fitting.



(Continued on next page)



Catalogue number **B0597**
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DESIGNED FOR PRODUCTION (Continued from previous page)

In a separate section of the factory the sub-assembly processes are being completed with the manufacture and assembly of such items as brake parts, pedals, hubs, cranks, handlebars, the building of wheels and the fitting of tyres to the wheels, all these items then being passed to a central store for subsequent re-issue to the home or export assembly lines.

The sub-assembly section is always one of the most fascinating to the visitor, for here he sees expert hands making light work of tasks which he is often called upon to perform in his own workshop. Wheel building and wheel truing, often sources of hours of patient endeavour to the amateur repairer, are made to appear simple in the factory, and whilst tyre fitting is perhaps not too difficult a matter for the clubman class of rider, he would be amazed how quickly this task is performed by a simple "home-made" device in the B.S.A. factory, which simply runs a pulley wheel round the inside of the rim, easing the tyre into position as it goes.

The assembly line operates on the moving belt principle, and here the gears, mudguards, brakes, bottom bracket units, wheels and so on are added as the machine moves slowly along the belt to where it can be inspected finally as a complete bicycle.

One could not fail to be impressed by the degree of checking that is carried out in this factory to ensure complete accuracy of manufacture, and just as interesting were the obvious results of careful planning in the easy flow of production from individual units into a complete bicycle.

Planning is quite obviously the secret, for when you are dealing not only with high production figures but also 120 different designs of basic models that can be built up into 5,000 variations according to the customers' desires, then utter confusion would be the inevitable result without it. Indeed, the B.S.A. factory can be quoted as an example of scientific building in more ways than one for, apart from the careful system, almost every stage in the manufacture is governed by the company's scientists who regulate all the time processes, carry out frequent tests of materials and maintain a constant watch over such important factors as the mixtures used in the brazing processes.

A final word is due in this survey of the factory to the excellent showroom where the company's products are on display in a fine setting. Here one can appreciate the sense of pride the company and its employees take in its products, and for the bicycle rider, such pride is an assurance of high standards of workmanship.

CYCLING

Editor - - H. H. ENGLAND
 Assistant Editor - GEORGE PEARSON

PROPRIETORS :
TEMPLE PRESS LIMITED
 CHAIRMAN AND MANAGING DIRECTOR :
ROLAND E. DANGERFIELD

Head Office: BOWLING GREEN LANE, LONDON, E.C.1.
 Telephone: Terminus 3636. Telegrams: "Pressimus, Phone, London."
 Birmingham—5 Suffolk Street. Telephone: Midland 4117-8.
 Coventry—50 Hertford Street. Telephone: Coventry 62464.
 Manchester—1 Brazennos Street. Telephone: Blackfriars 5038-9.
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