X-RAY FOR STEEL

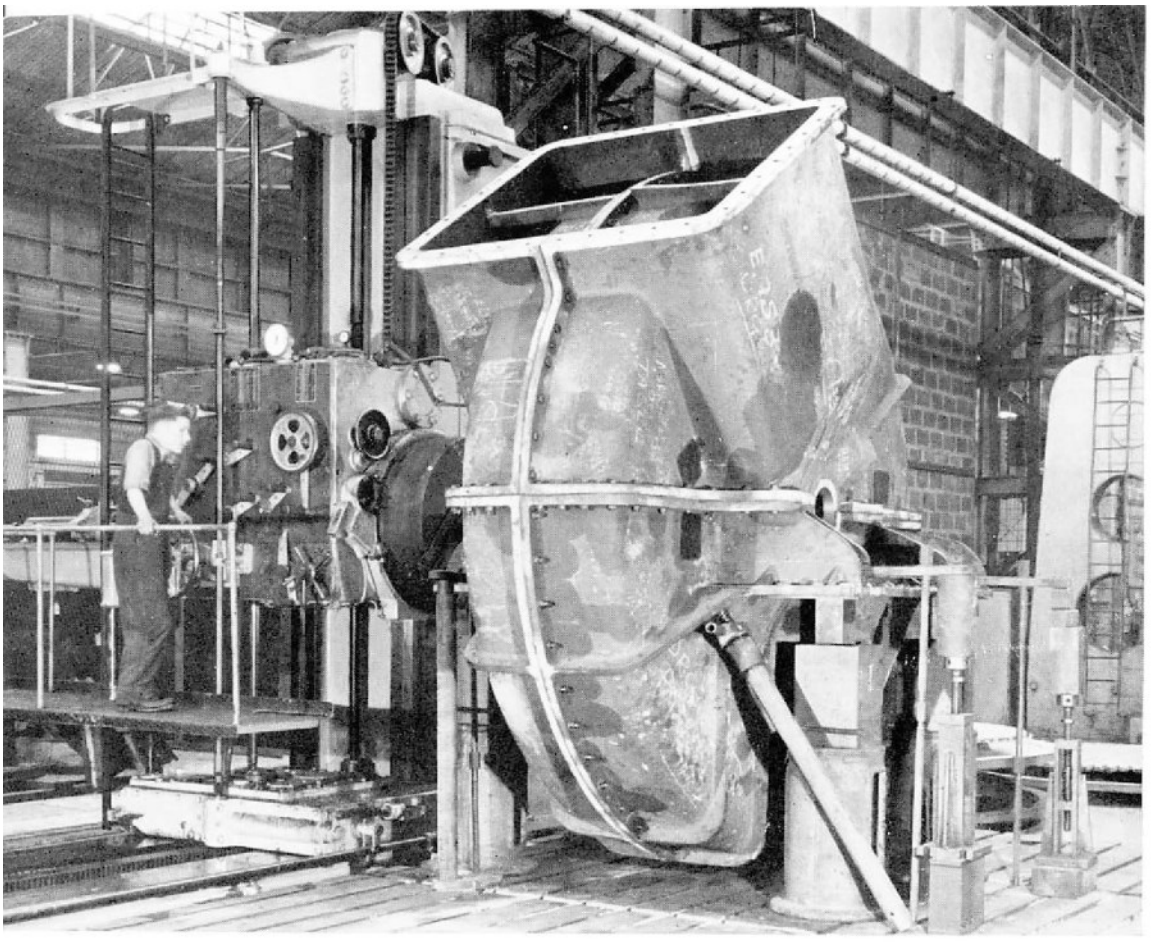
THE SIGHT OF turnings flying from a piece of steel being worked on a lathe, brings to mind the making of that tough and solid metal in the great industrial towns of the north, and the people who make it. It also reminds us that at St. Albans we make an Industrial X-ray apparatus, capable of penetrating steel four inches thick.

About a seventh of all Britain's steel is produced by the United Steel Companies, of which the Distington Engineering Company is a branch.

At the Distington Works on the Solway coast, there is a large output of steel work of many kinds. Some of the more specialised jobs are also done here and, in particular, the building of pressure tanks and vessels for holding gasses and liquids. These pressure vessels are built to most exacting specifications and all joints and seams must be welded.

To ensure perfect safety, welds must be subjected to the most stringent inspection. The most suitable method is to use X-ray equipment, and a Marconi Instruments 250 kV Constant Potential Industrial X-ray Unit has been ordered. Its main duty will be to carry out non-destructive testing of arc welding used

The Marconi Instruments mobile industrial X-ray equipment for the Distington Engineering Company's works in Cumberland. It is mounted on a specially-designed trailer



on this kind of work, and now it will be possible for the firm's Fabricating Department to prove the high standard of their work.

The Distington Engineering Company produces castings in various kinds of iron, and also purchases steel castings. A large proportion of the iron foundry output consists of ingot moulds and the slag ladles for use in iron and steel works, and the remainder is devoted to chemical and general engineering castings, both medium and heavy. Machine and engine bed plates, blocks for mechanical hammers, heavy casings for pumps, fans and other machinery, flywheels, large sluice valves, components for distilling and cracking columns for oil refining, and the heavy iron parts of various kinds of industrial furnaces, are all made in hematite iron.

Castings of all kinds are liable to have cavities, small or large, beneath the surface of the metal, and this is where the second duty of the M.I. X-ray unit comes in. In certain cases cavities can be tolerated in an iron casting, but rarely when they appear at the surface of a machined face, where the metal is highly stressed or where it must withstand pressure exerted by a liquid or a gas. The X-ray unit will permit the operator to detect the presence of undesirable cavities in castings before the heavy expense of machining is incurred.

In view of the great size and weight of some of the castings and welded steelwork, the X-ray equipment is required to be mobile, and a specially designed two-ton trailer is provided. The control unit is installed in a lead-lined protective compartment, opposite the tube-stand and oil-cooled shockproof tube-head. The voltage range is from 30 to

250 Kilovolts, so that steel of up to four inches thick can be penetrated. The constant potential generator enables the whole of the high voltage energy to contribute to X-ray generation, and the maximum X-ray output thus achieved greatly shortens exposures.

LEFT: *The machining of huge castings such as this iron fan casing is a skilled and expensive operation. The M.I. X-ray will be used to detect any possible flaws below the surface before machining is started. This casing was cast in the firm's own foundry*

Checking by means of an immersion pyrometer the temperature of hot metal, tapped from a cupola at the foundry

BELOW: *A circumferential seam of a steel tank being automatically welded at the Distington Engineering Company's works. Longitudinal seams can likewise be automatically welded by this machine. A main duty of the Marconi Instruments X-ray ordered by this firm will be to inspect welded seams on high quality pressure vessels*

Photos: Distington Engineering Co.