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### Ohio State Engineer

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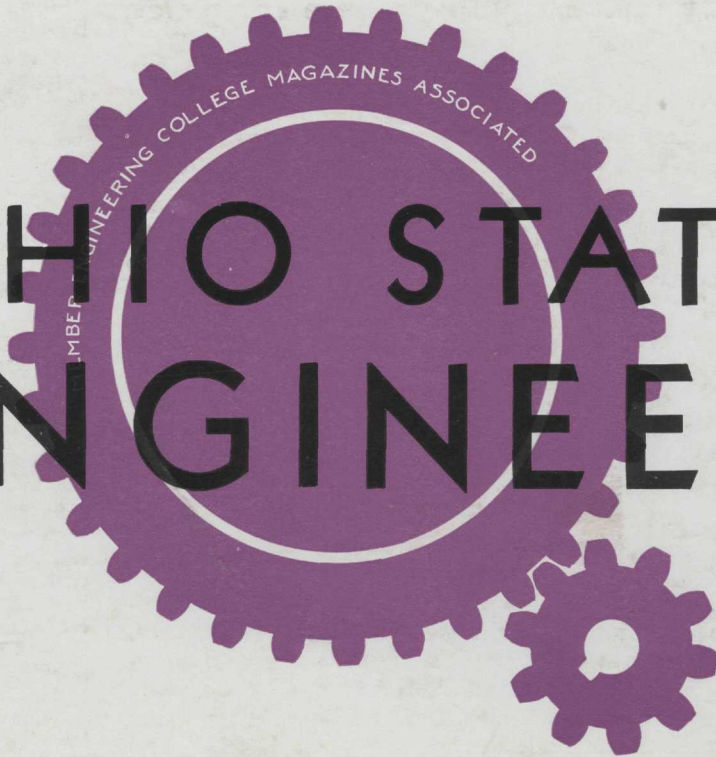
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# THE OHIO STATE ENGINEER



A DIE CASTING . . . . . FOOL  
 P PROOF . . . OHIO'S ENGINEER-  
 R ING FIRSTS . . . THE MOHAWK  
 I DAM . . . . . TOURING NEAR  
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 LIGHTING . . . THE ENGINEER'S  
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# Checkmates Corrosion

**Welding aids modern metallurgy to produce completely corrosion-proof assemblies**

**E**QUIPMENT is subject to corrosive attack and consequent deterioration by three forces: chemical attack, electrolysis and erosion. Chemically active gases, liquids, pastes, or solids eat away the more easily attacked portion. Dissimilar metals often set up galvanic currents, which cause pitting and corrosion. High-velocity steam or solid particles in a slurry add mechanical abrasion to the ravages of chemical and galvanic attack.

## Welding Prevents Deterioration

Welding is a valuable aid to users and fabricators of equipment for corrosive service. By welding, equipment can be made smooth, jointless—one-piece. Valves and necessary fittings can be faced with corrosion-resistant metal welded in place. Chemical attack can be further prevented by making welds of material similar to the body metal.

Welded assemblies present a smooth, unbroken internal surface. No pockets are formed in which concentration and consequent deterioration can occur.

Galvanic attack, which occurs with other types of assembly, ceases to be a factor in welded equipment. In a welded assembly, the same or similar metals are fused together. Perfect electrical contact prevents the damage due to galvanic ac-

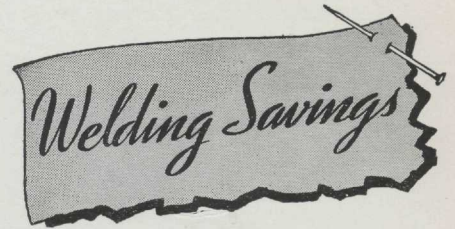
tion. Abrasion by steam, water, or solids is prevented by welding on hard alloys at constrictions and bends.

## Welding Stops Corrosion Losses

Abrasion, chemical attack, electrolysis, are defeated on a thousand fronts by welding. New equipment, designed to resist corrosive conditions and fabricated by welding to assure satisfactory performance, is achieving enviable records in service. Equipment which would otherwise be scrapped is renovated and protected against further deterioration. Many corrosion problems, localized in extent, are conquered through the application of resistant materials to the affected parts by welding.

As a result of the successful application of welding to check corrosion losses, industry is saving money. Repair and replacement bills are cut. New machinery and supplies have a longer life, and thus amortization charges are lowered. Less valuable production time is lost through shutdown and accident.

A few of the many ways by which welding checkmates corrosion, selected from actual case histories, appear in the column at the right. These and many other similar welding applications may be utilized in your future business.



In the textile industry, stainless steel is used for dye-vats, tanks, buckets, dippers, and many other purposes. The equipment, welded throughout, resists chemical action, is smooth inside and therefore easily cleaned, and is strong and durable.

\* \* \*

Wear by sandy water had pitted the surfaces of two 42-inch diameter balance needle valves so seriously that the valves would no longer operate efficiently. Twenty-two hours of welding saved these expensive semi-steel castings, which otherwise would have been scrapped.

\* \* \*

In redesigning several 700-gallon tanks for food storage, it was necessary to eliminate an unsanitary and corrosion-ridden condition. The tanks were redesigned to be made from stainless steel with welded joints. The inside and outside are now permanently free from undesirable laps where germs might lodge or corrosion might start.

\* \* \*

Sea water had seriously corroded the impellers of cargo pumps on an oil tanker. Five hours of welding repaired this damage at a fraction of the cost of new parts. Resistant metal used for the repair will prevent recurrence of trouble.

\* \* \*

Welded piping in the floor of a skating rink successfully resists severe corrosion in addition to mechanical stress. No mechanical joint could withstand this service. The piping carries alternately refrigerating brine for freezing the skating surface and steam for melting it.

\* \* \*

Milk storage tanks for a chocolate manufacturer were welded to prevent corrosion and unsanitary conditions. These tanks were fabricated entirely of stainless steel. They were welded to prevent corrosion at the seams as well as off-taste in the milk. The smooth, flush, inside surface left no pockets for chemical and bacterial action to produce spoilage.

\* \* \*

A container for caustic soda solutions, made of Monel metal to resist corrosion, had a cast iron plug in the base. Corrosion troubles were imminent. By welding this and all other joints, corrosion was successfully prevented.

\* \* \*

*Tomorrow's engineers will be expected to know how to take advantage of this modern metalworking process. Many valuable booklets describing the oxy-acetylene process are available without obligation. For further information write any Linde office.*

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Unit of Union Carbide and Carbon Corporation



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**THIS ALL-WELDED KITCHEN UNIT** includes sink, dishwasher, drainboard, working space, and closets. It is made of stainless steel, welded into a jointless unit which is strong, easy to clean, and resistant to corrosion. Many of the utensils also are of stainless steel.

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