GASHOLDER AND STRUCTURAL BUILDING WITH THE ELECTRIC ARC.

By H. E. Grove, Past President.

The lecturer traced the early history of electric arc welding in general and especially its development and use by the Construction Department of the Metropolitan Gas Company, where arc welding had entirely superseded rivetting in all classes of structures and machines. Twenty-two welders were continuously employed, and they had created records that could never be broken. They had welded the first gas-holder floating bell in the world when the 3 million cubic feet gasholder at South Melbourne had been re-built and they had, in the 2½ million gasholder at Fitzroy, welded the first complete structure of a gasholder in the world. In this latter holder the guide framing as well as the bell had been completely welded, and the holder came out of a long rigorous test with flying colours. There was not the slightest evidence of a leak in the sixteen miles of welding, and the holder had proved truly level. The complete structure of 760 tons had been fabricated and erected in ten months.

A further record had been accomplished by the welding on of a complete new crown on a three-lift gasholder at the Fitzroy works while the gasholder was continuously in action. This apparently very difficult job had been accomplished most successfully and with a surprising amount of ease, and it showed what great possibilities lay in the use of the electric arc when repairing or renewing plant that could ill be spared.

The lecturer showed 84 lantern slides, the majority of which showed the complete fabrication and erection of the 2½ million gasholder at Fitzroy. The remainder showed the many varied uses to which the electric arc had been put in welding, amongst which were shown a two million cubic feet per day Woodall Duckham retort house—a steel stack 100 feet high self supported, gas washers, water tube condensers, etc.

The lecturer strongly stressed the fact that they did not use bare wire electrodes in their work, but that covered electrodes were used exclusively.
The South Melbourne gasholder, shown on Plate I., replaces the old holder, the original guide framing remaining. The new floating bell is completely welded. Capacity, 3 million cubic feet; height, 100 feet; diameter of tank, 200 feet; weight, 600 tons.

The Fitzroy holder, shown on Plate II., is completely welded both into framing and floating bell. Capacity, 2½ million cubic feet; height of standards, 144 feet; diameter of tank, 163 feet; depth of tank, 36 feet 6 in.; weight including framing, 760 tons. No rivets of any description used, the electrodes taking their place.

Fig. 1 on Plate III. shows the method of welding the 9/64-inch side sheeting in the lifts, and indicates the method of propping out the sides while welding.

Fig. 2 on Plate III. shows the style and carriage, or goose-neck, that has been evolved. This form combines strength with the greatest economy.

DISCUSSION.

The President said all would agree that they had listened to a most interesting lecture. He wished to thank Mr. Grove for the references to his small part in the design of the structure. It would be sufficient for him to say that the success of that entirely novel method of construction was greatly due to Mr. Grove and his assistants, and to the staff of welders who had been trained in the workshops, and the staff of erectors. As Mr. Grove had said, a great load had been lifted from the minds of those responsible when the venture had been successfully concluded. The University had carried out more than 300 tests, and it was largely on the results of those tests that they had adopted welding. He moved a hearty vote of thanks to Mr. Grove for his interesting lecture.

The vote was carried by acclamation.
South Melbourne Three-Million Gasholder.

The first floating bell in the world to have been electrically welded.
FITZROY 2½-MILLION GASHOLDER.

The first complete structure of its kind, in the world, to have been electrically welded throughout.
Plate 1

Fig. 1. **Welders at Work on Sides of Fitzroy Holder.**

Fig. 2. **Curb and Carriages Fitzroy Holder.**
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Grove, Harry Ernest

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