

problems of coupling a pentode tube to a loud-speaker; and some original work on an amplifier involving de-generation to meet the same problem. A number of measurements are shown to back up the discussion on each topic.

M. ENG.

MINING

R. C. JEFFREY GOODE

PROBABLE CHEMICAL REACTIONS AND THEIR EFFECT
ON SULPHIDE FLOTATION.

An investigation was made of the chemical compounds formed between metallic sulphides, especially pyrrhotite and pyrite, and alkalis as commonly used in the grinding circuits of Sulphide Flotation Mills.

The effect of oxidation on these minerals was examined.

Experimental tests were made to determine the resultant action of these compounds upon chalcocopyrite flotation.

A hypothesis has been advanced, and experimental evidence produced, for the necessity of pre-flotation aeration in mills treating heavy sulphide ores.

M. ENG.

MINING

D. M. JAMIESON

AN INVESTIGATION OF THE POSSIBILITIES FOR
AIR CONDITIONING IN HOT, DEEP MINES.

In this discussion the following are the main divisions:—

- (1) A review of all the factors tending to increase the temperature and humidity of mine downcast air.
- (2) A review of the effects on the workers of hot, saturated air, and a discussion as to what may be considered the maximum safe temperature and humidity conditions.
- (3) A brief survey of all known examples of mine air-cooling and dehumidifying methods at present in existence.
- (4) A discussion pointing out that the limiting temperatures are even now being reached, and that for greater depths, air-conditioning must be resorted to.
- (5) A discussion of all possible methods of alleviating conditions, and the conclusion, that the conservation of the evaporative capacity of the surface air must be maintained, and the use of ice, or compressed air expanded in doing useful work, would be the best auxiliary means, worked in conjunction with the first.

M. ENG.

CIVIL

LLEWELLYN JEHU

AN INVESTIGATION OF STRESS IN WELDED JOINTS.

The object of this investigation was first, to evaluate the residual stresses in members which have been welded by various methods, and second, to determine the effect which stress relieving has upon them.

Four types of weld were considered in each case, these being:

- (1) Weld Metal deposited in one layer with bare electrodes.
- (2) Weld Metal deposited in two layers with bare electrodes.
- (3) Weld Metal deposited in one layer with covered electrodes.
- (4) Weld Metal deposited in two layers with covered electrodes.

The specimens in all cases were mild steel plates 12 inches wide, $\frac{3}{4}$ inches thick and 21 inches long with the weld metal deposited in "U" shaped grooves in the long sides of the plate.

The deformation caused by welding was first recorded after which the specimens were severed into strips in order to measure the elastic residual stresses throughout the various plates.

It was found that the stresses in the welds varied from about 10,000 to 40,000 lbs. per square inch and that, after stress relieving, the stresses in every case were reduced to less than 5,000 lbs. per square inch.