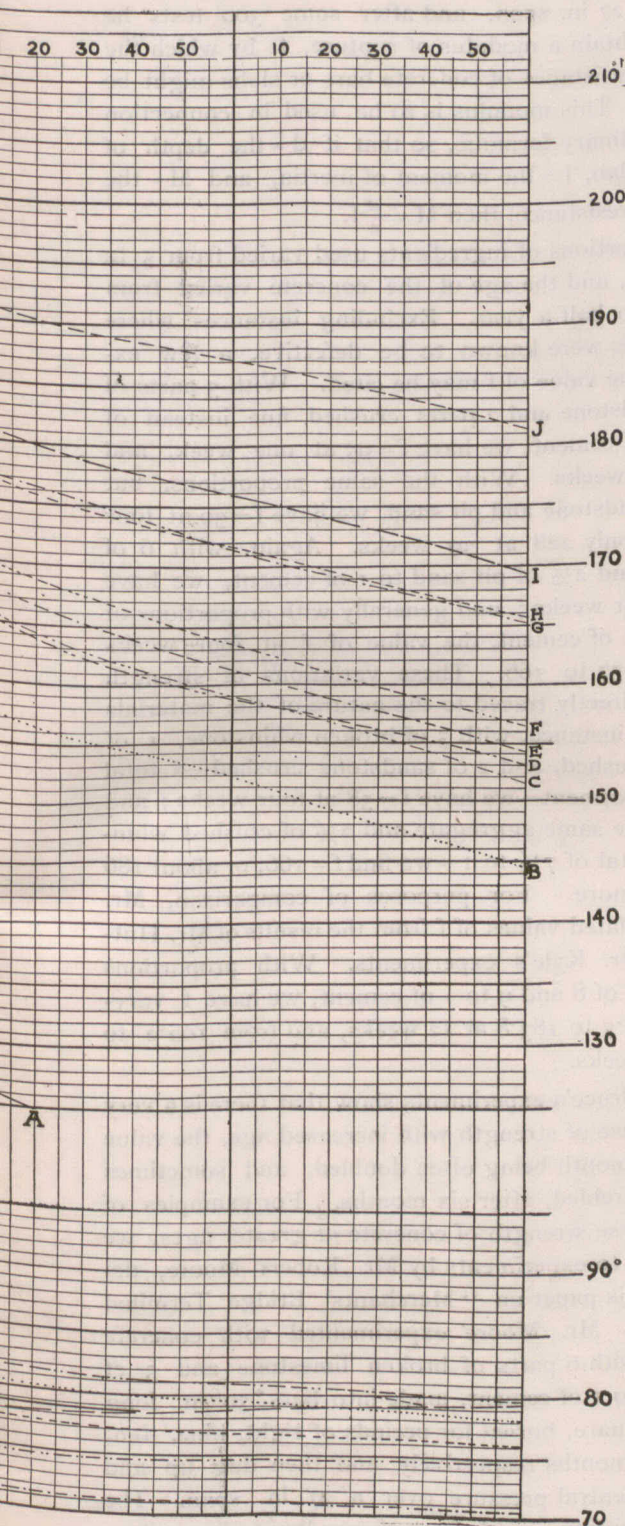




R. Robinson
Mech. Supr.

6th HOUR.

7th HOUR.



Expt. Tank covered with Patent Mineral Composition, and outer coat Russian iron Comp. $1\frac{1}{2}$ in. thick. C
 " covered with Plastic Asbestos, taken off C. P. R. Boilers, and outer coat Russian iron Comp. $1\frac{1}{2}$ in. thick. B
 " with air-space of $1\frac{1}{8}$ in. next tank, air-tight iron coat $1/16$ in. full thick and outer coat Russian iron Comp. $1\frac{1}{2}$ thick. E
 " covered with Patent Mineral Composition. F
 " " Mica Boiler Covering. J

The position of the various coverings on the chart be found by the corresponding letters.

EXPERIMENTS WITH BOILER COVERINGS.

THE accompanying chart is a reproduction of a diagram of experiments with boiler coverings made by the Canadian Pacific Railway Co. to test the values of various compounds as non-conductors of heat.

It will be seen that water at 212° was used, the relative value of the coverings as non-conductors being determined by the number of degrees of heat which escaped through the different substances and the consequent cooling of the water in a given time. A reference to the chart shows that ten experiments were made. It will not be necessary, however, to refer to all of them, as the results of some were so unimportant, as in experiments 4, 6 and 9, as to render them of little interest or value. It is only necessary to say that the trials were made under as nearly similar conditions as possible, as will be seen by the diagram of the atmospheric temperatures during the tests. The readings were taken from thermometers passed through the coverings and down into the body of the water.

The chart shows the loss of heat in the uncovered tank up to the 5th hour only, and to make a fair comparison the others should be taken for same time. The temperature at beginning of each test was 212° , and the following table shows the temperature at end of fifth hour, the loss in five hours, and the loss in the fifth hour:—

	Loss in 5 hours.	Temp. at end of 5th hour.	Loss in 5th hour
Bare tank.	84°	128°	11°
Asbestos compound.	53°	159°	9°
Sectional magnesia blocks.	$33\frac{3}{4}^{\circ}$	$178\frac{1}{4}^{\circ}$	7°
Wood lagging and air space	30°	182°	6°
Asbestos and wood.	20°	192°	5°

The mean temperature of the surrounding atmosphere during the 5th hour may be taken as having been 78° .

The fairest comparison of the merits of the coverings is made by considering the loss of heat in one hour per degree of difference of temperature between the tank and its surrounding atmosphere.

The following table shows this worked out:—

	Mean temp. during 5th hour.	Difference between tank and atmosphere.	Loss in 5th hour.	Loss in 5th hour per degree of difference of temperature.
Bare tank.	$133\frac{1}{2}^{\circ}$	$55\frac{1}{2}^{\circ}$	11°	.198
Asbestos comp.	$163\frac{1}{2}^{\circ}$	$85\frac{1}{2}^{\circ}$	9°	.105
Sectional Magnesia blocks.	$181\frac{3}{4}^{\circ}$	$103\frac{3}{4}^{\circ}$	7°	.0674
Wood lagging and air space	$181\frac{3}{4}^{\circ}$	$103\frac{3}{4}^{\circ}$	7°	.0674
Asbestos and wood.	185°	107°	6°	.056
Mica.	$194\frac{1}{2}^{\circ}$	$116\frac{1}{2}^{\circ}$	5°	.0428

The following table shows the value of the coverings as compared with the bare tank.

Amount of heat which escapes from the bare tank was 1.88 times greater than through the Asbestos compound.	
2.92 " " " " " Sectional Magnesia blocks.	
2.92 " " " " " Wood lagging and air space.	
3.53 " " " " " Asbestos and wood.	
4.62 " " " " " Mica.	

Mica shows by far the best result as a non-conductor of heat, and saved

245 per cent as much heat as the Asbestos compound.	
157 " " " " " Sectional Magnesia blocks.	
157 " " " " " Wood lagging and air space.	
130 " " " " " Asbestos and wood.	

It will be seen from the diagram that the loss by radiation through "sectional magnesia blocks" and "wood and air space" was practically the same, there being less than $\frac{1}{2}^{\circ}$ Fht. between them at the expiration of the test.

It will be seen that asbestos cement, which is in very