gravity of the section cut the base at a point one-third the thickness of the dam from the rear face.

Fifth: That the safe load (tension) on the reinforcement is 12,000 lb. per square inch.

Sixth: That the neutral axis of dam, considered as a beam, is at a point 0.4 the effective thickness from the downstream face.

Seventh: That the thrust in the arch is uniformly distributed over the thickness of the dam.

The general method used is to assume the safe load on the reinforcement, find what part of the water pressure can be safely carried by the dam considered as a beam, and then assume that the arch carries the remainder of the pressure.

In the following equations the various functions are represented by the following letters:

P = Total overturning pressure on the dam, in tons;
P″ = That part of P assumed to be sustained by the beam action, in tons;
P′ = That part of P assumed to be sustained by the arch action, in tons;
w = Weight of 1 cu. ft. of water, in pounds;
r = Radius of curvature of dam, in feet, = 324;
j = Thickness of the dam at any point, in feet;
h = Height of the dam at any point, in feet;
W = Weight of masonry in the dam above any point, in tons;
T = Thrust in arch due to P′, in tons per square foot;
y = Assumed stress in steel, in tons;
c = Maximum compression in the outer face of the dam due to beam action alone, in tons per square foot;

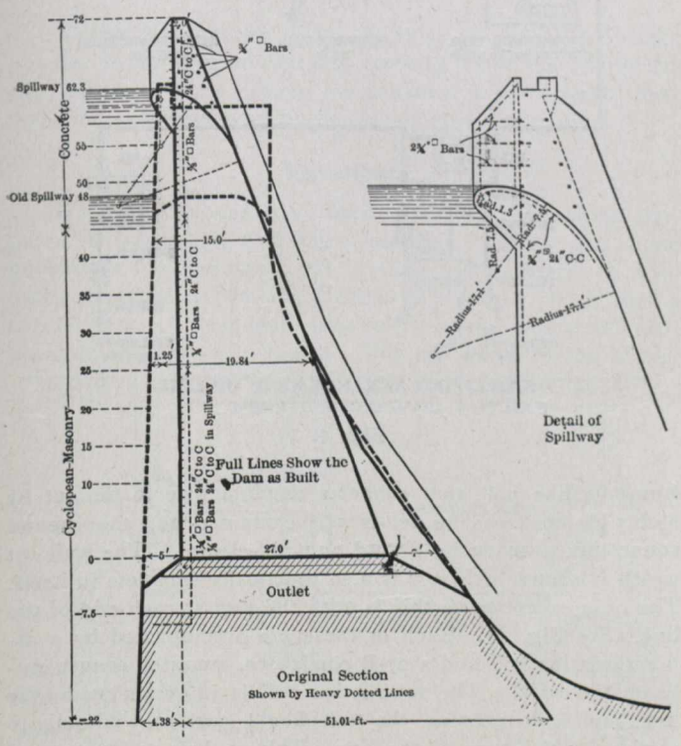

Fig. 2.

z = Total compressive stress in dam due to beam action alone, in tons;
q = That part of the pressure at any point sustained by arch action alone, in tons.

A diagram of the stresses acting on the dam is given in an accompanying cut.

Expressing moments around the center of gravity of compression forces, we get,

$$-\frac{1}{3} P'' h - W\left(m + 0.5 - \frac{1}{3} j\right) - y m = o$$

Solve for P″.

Then
$$P' = P - P''$$
$$q = 2 P'/h$$
$$T = q r/j$$

To determine c, take moments around y:

$$\frac{1}{3} P'' h + W\left(\frac{1}{3} j - 0.5\right) - o\,(0.2\,j - 0.1)\,m = o$$

Solve for c.

The stresses obtained by this method are shown in Table 1.

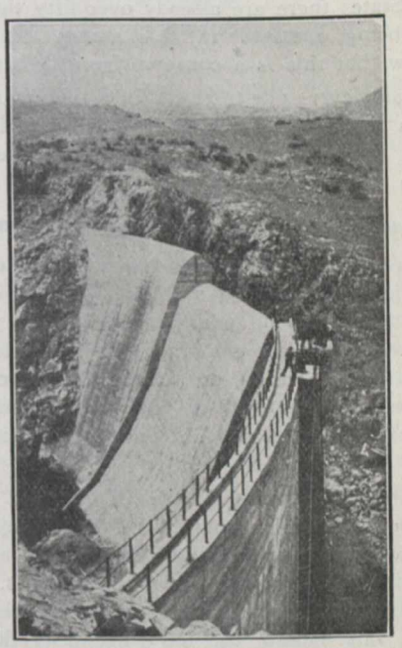

Fig. 3.

Table 1.—Summary of Stresses.

Elevation.	Tension in steel in tons per square inch.	T.	c.
62.3 Spillway	0.0	0.0	....
60	0.0	0.0	....
50 Calculated	4.5	0.0	5.8
40 Assumed	6.0	4.4	8.0
30 "	6.0	7.2	9.7
20 "	6.0	7.5	12.3
10 "	6.0	9.3	13.5
0 "	6.0	10.5	15.7
0 "	10.0	9.1	10.3

The factor of safety is about 6.

A PECULIAR SHORT CIRCUIT.

A letter box placed on the junction of two principal streets in Victoria, B.C., came in contact with the wires belonging to the lighting circuit recently. Several people who used it were severely shocked. The condition of the box was finally intimated to police headquarters, and an officer was sent to the corner to warn passersby until the trouble was attended to.