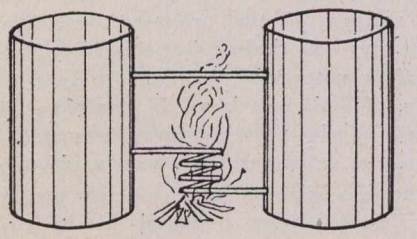
CONCRETE SECTION

ARRANGEMENTS FOR HEATING MATERIAL FOR CONCRETE.

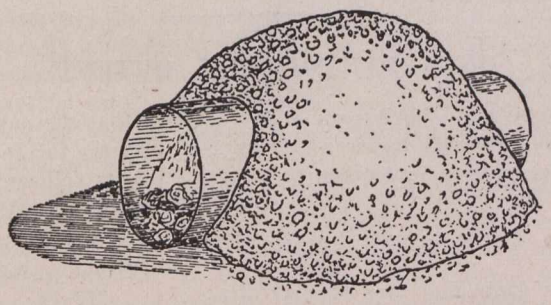
Concrete has become such a universal and necessary material for construction work that the close of the building season in Canada usually sees large quantities of concrete work uncompleted, and the devices which are adopted to maintain heat in the material until it has properly set are numerous.

Recently we saw specifications which stipulated that



concrete was not to be placed where the temperature was lower than 30 deg. F. before there is any danger from frost able, as under certain conditions temperature can be much lower than 30 deg. F. before there is any danger from frost when placing concrete. If it is a large body of concrete, and the sand, gravel and water are well heated, there is no danger from frost at 20 deg. F., provided it is possible to protect the material when in place.

For heating the sand, if it is stored in bins and run directly into the mixer, steam coils may be used, but if it is shovelled by laborers direct into the mixer, one of the most suitable devices for heating the gravel is of cast-iron pipe. The material is heated over a pipe, the fire started inside.



Defective cast iron water pipes are quite suitable for this work. Frequently we have seen sheets of steel or wrought iron used, but when they become heated, they warp and cave in, and thus are not so suitable as the cast-iron pipe.

The accompanying sketch illustrates a simple arrangement for heating the water to be used in concrete work in cold weather. Two barrels six feet apart are used, one placed a couple of feet higher than the other. A piece of two or three inch water pipe is bent into coils and connected up and fire placed under the coil, and as the water flows from one barrel to the other it is heated.

CEMENT CONCRETE VATS AND TANKS.

By Albert Moyer, Assoc. Am. Soc. C.E.

Impervious, odorless, tasteless and sanitary vats and tanks for butter-milk, wine, oil, pickles, sauer kraut, etc., can be constructed of reinforced concrete, the reinforcing to be designed by a competent engineer, provided the interior surfaces are treated as follows:

After the forms are removed, grind off with a carborundum stone, any projections due to the concrete seeping through the joints between the boards. Keep the surface damp for two weeks from the placing of the concrete. Wash the surface thoroughly and allow to dry. Mix up a solution of 1 part water glass (sodium silicate) 40 deg. Baume with 4 to 6 parts water, total 5 to 7 parts, according to the density of the concrete surface treated. The denser the surface the weaker should be the solution.

Apply the water glass solution with a brush. After four hours and within 24 hours, wash off the surface with clear water. Again allow the surface to dry. When dry apply another coat of the water glass solution. After four hours and within 24 hours, again wash off the surface with clear water and allow to dry. Repeat this process for 3 or 4 coats, which should be sufficient to close up all the pores.

The water glass (sodium silicate) which has penetrated the pores has come in contact with the alkalis in the cement and concrete and formed into an insoluble hard material, causing the surface to become very hard to a depth of ⅛ to ½-inch, according to the density of the concrete. The excess sodium silicate which has remained on the surface, not having come in contact with the alkalis, is soluble; therefore easily washed off with water. The reason for washing off the surface between each coat and allowing the surface to dry, is to obtain a more thorough penetration of the sodium silicate.

It is obvious that concrete surfaces so treated, if hard, impervious and insoluble, have been made impervious, tasteless, odorless and sanitary.

TABLE OF PROPERTIES OF CONCRETE.

Proportions.	1†.	2.	3.	4.	5.	6.
1 : ½ : 1	6.8	3.97	$.37	$.34	5,340	...
1 : 1 : 2	9.7	2.79	.314	.274	4,000	...
1 : 1½ : 3	12.6	2.14	.283(a)	.237	3,200	835
1 : 2 : 4	15.6	1.73	.264	.214	2,700	...
1 : 2½ : 5	19.0	1.42	.246	.195	2,300	...
1 : 3 : 6	22.8	1.18	.23	.179	2,000	...
1 : 3½ : 7	26.6	1.02	.219(b)	.169	1,785	486
1 : 4 : 8	30.4	.89	.210	.160	1,625	...
1 : 4½ : 9	34.2	.79	.205	.154	1,500	...
1 : 5 : 10	38.0	.71	.200	.149	1,400	...
1 : 5½ : 11	41.8	.65	.195(c)	.145	1,320	347
1 : 6 : 12	45.6	.59	.192	.141	1,250	...

(a) First-class brickwork in cement mortar, 44 cents per cubic foot.

(b) Good brickwork in cement, 35 cents.

(c) Ordinary brickwork, 26 cents.

*Derived and used by the Aberthaw Construction Company, Boston, Mass.

1†. Vol. in place cu. ft.

2. Bbl. of cement per cu. yd.

3. Cost per cu. ft. broken stone concrete.

4. Cost per cu. ft. gravel concrete.

5. Ult. compr. strength broken stone concrete, 1 month old, per sq. inch.

6. V. ult. compr. strength per sq. inch of brickwork.