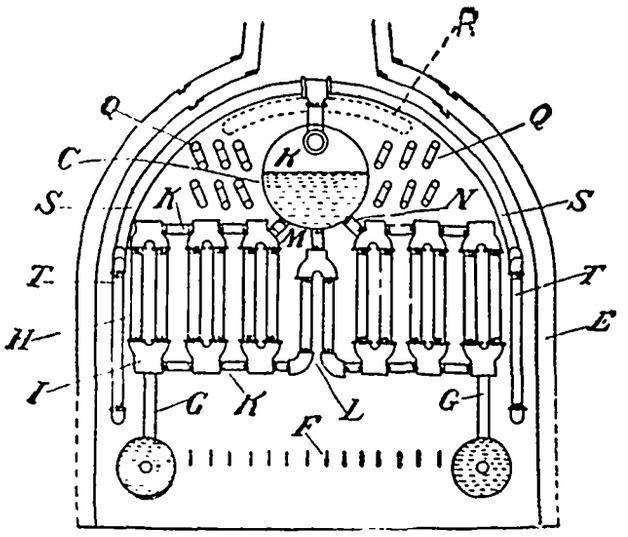

FIG 2.—Sectional front elevation, showing
E—Double jacket side-covering.
F—Grate bars.
G G—Upright connections between side-flow pipes and steam-generating sections.
H—Steam generating loops
I—Special malleable iron fittings.
K, K—Lateral pipe connections between fittings
L—Division line between the steam-generating sections, to permit of expansion
M—Connection between expansion Y and drum.
N—Connection between steam-generating sections and drum
Q, Q—Feed-water coils
R—Dry-pipe lying in steam portion of water-front and water-back
S,S—Connections between steam-drum and super-heating coils.
T—Upright super-heating pipes

Through the arrangement of the short upright pipes, the most rapid generation and liberation of steam is provided for. The steam is not required to make its way through 30 or 40 feet of pipe returned on itself several times, and filled with water. It is claimed that a steady water-level is maintained under all circumstances, and that it is impossible to boil the water out of the steam-generating sections, as these are re-supplied with water through the large quantities carried in the front and back as fast as converted into steam. This is an improvement over inadequate "downflow" pipes for supplying the steam-generating pipes There are no fluctuations present in the Finlayson Boiler in quantity or level of water, or in the steam pressure, due to the larger quantity of water carried.

The grate surface is very large, and this combined with the other features, insures the greatest possible efficiency.

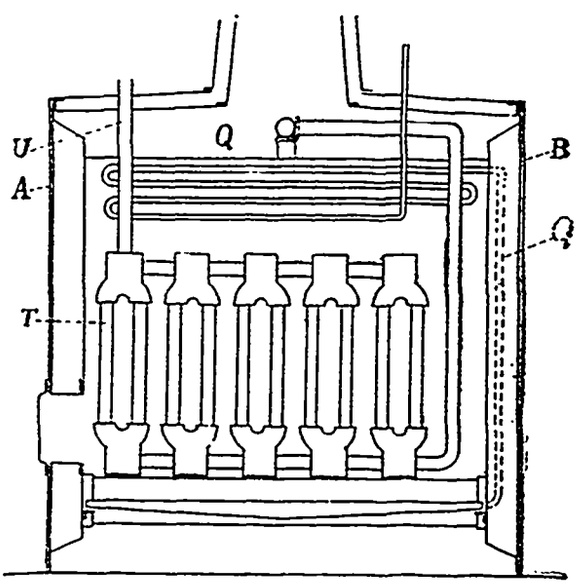

FIG. 3.—Side elevation Finlayson Boiler, showing particularly the arrangement of super-heating coil (*T*), its connection with steam-drum, and outflow through engine supply pipe *U*. A super-heating coil lies on either side of furnace.
A & B—Represent a water-front and water-back.
Q, Q—Feed-water coil.

The super-heaters are so arranged as to provide absolutely dry and highly expanded steam, and priming is avoided By providing free escape for the dry steam at the top of each perpendicular pipe in the super-heater, and all being connected with engine supply pipe, any water that might by any possibility be carried over into the super-heater, would not be drawn or forced into the engine, as must result in the horizontal continuous super-heating coils. The super-heating coils receiving all the heat passing through between the rises from the side-flow pipes, would rapidly convert any water that might react them into steam, and thus absolutely dry steam is guaranteed.

Another point in its favor is simplicity of construction The boiler is provided with a double heavy iron side and top casing lined with thick fire felt, and is complete for steam and motor connections as it leaves the shop. Scale and mud are easily removed by means of blow-off cocks inserted opposite side-flow pipes, and if necessary every section can be washed out by insertion of nozzle of water hose.

Those interested should send for illustrated catalogue to Doty Bros. & Co, Toronto, Ont.

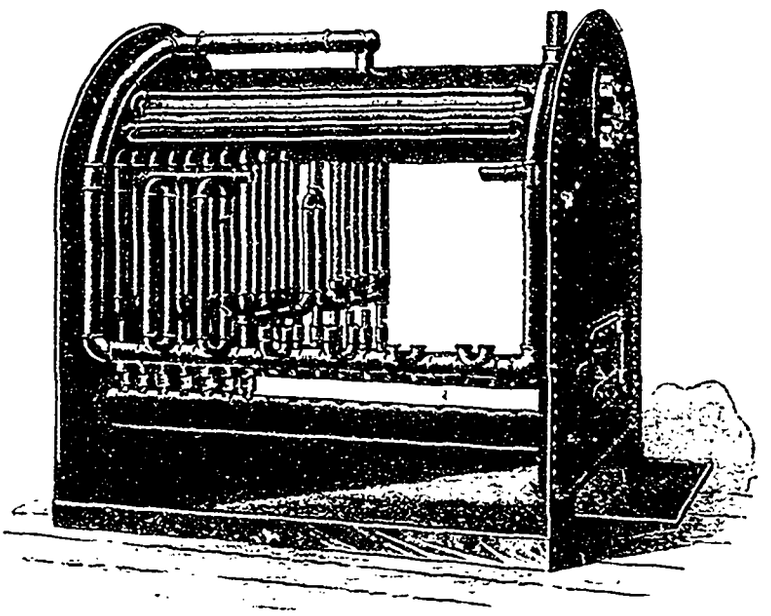

FIG. 4.—Finlayson Boiler in process of construction, with only part of the steam generating loops and superheating pipes in position, showing particularly the arrangement over the fire

THAT WATER-WHEEL PROBLEM.

The water-wheel problem propounded by Mr. Bell, of Welland, in the October number of THE CANADIAN ENGINEER, has elicited a good deal of correspondence, and Mr. Bell will at least have gained some new light on the subject. Two further letters received are given below. Mr. McCallum's long study of the operation of water-wheels will give his letter and rough sketch special interest:

Editor CANADIAN ENGINEER:

In THE CANADIAN ENGINEER of October, 1893, page 149, I notice an article headed "A Problem." In reply I would ask you, whether you do not think the cause of the difficulty in not getting as much power from the first wheel when the second is not running might be because when the second wheel is not running the water backs up on the first wheel and "floods it."

If you had a flume or box running across the penstocks and take the water as required to each wheel, it might be a benefit, or shut off the supply of water when the second is not running.

Yours, etc.,

A BURROWES.

Deseronto, Ont

Editor CANADIAN ENGINEER:

I have looked into the problem, and I think it rather strange; I sometimes think that it cannot be properly put.

Less power will certainly be obtained from No. 1 wheel than when 1 and 2 are working together, but I can hardly think that No. 2 wheel will give as much power as 1 and 2 together; if so, as I