

cracks run longitudinally and are clearly marked, and that the cracks at right angles to the building are comparatively few.

Where the floor span decreases next to the large girders which support the paper machine the cracks begin to run at right angles, and end with diagonal cracks which die away into the part of the floor which was not heated. It is suggested that the cracks at the wall end of the building which are parallel to the main girder occurred because of the unequal heating of the big mass of this girder and the thinner floor slab, causing unequal expansion of the two masses. A similar cause may have produced the crack along the wall beam.

Because there was a considerable amount of water thrown upon light colored pulp and because the under side of the ceiling was blackened by the smoke from the fire, when the water carried the pulp through these cracks in the floor it showed these cracks very clearly on the under side. The cracking of the floor at the end of the paper-machine foundation is shown on cross-section "CD" (Fig. 1.)

At the end of the machine room, in the gallery, there was a stock house built with concrete piers, supporting a wooden floor carried on steel beams, with wooden columns carrying a wooden roof. The walls of the building were "hy-rib" metal. At the base of the building there were some brick walls. The interesting feature of the particular building was that the foundation piers which were subjected to high heat were built of concrete, rich in mortar. This concrete withstood the action of the heat much better than did the granite concrete of the main mill.

The stone used in the concrete on this job was coarse grain crushed granite. The sand was of good quality and the work was carefully done. The placing of the steel was better done than on the average job.

NON-PULSATING PUMPS.

A most interesting exhibit at the Canadian National Exhibition was that shown by the Luitwieler Pumping Engine Company, of Rochester, N.Y.; Canadian agents, The General Machinery Co., Limited, 526 Traders Bank Building, Toronto. One of the pumps exhibited by them is a triplex non-pulsating pump with 4 x 6-inch cylinders and six-inch stroke. The pump is operated by a five-horsepower motor, and pumps about 150 gallons per minute. It is designed to operate from 150 to 200 pounds pressure. One pleasing feature of the exhibit is the lack of jar noise or vibration in the running of the pump. The power is applied continually and evenly at all times by a nicely balanced arrangement of cams. By this means the water column is never allowed to slacken speed and the flow is therefore continuous.

The differentiating mechanical characteristics of the Luitwieler pumping engines are that dead centres and cranks are done away with, the rotary motion of the power being transformed into a straight line reciprocating movement by cams. A constant, unvarying load is always maintained. The resulting water delivery is even and non-fluctuating.

The two cams are key-seated oppositely upon one shaft and transmit the power to sliding yokes, the friction being relieved by rollers. These cams are so designed that each lifts the load through slightly more than a full half revolution, the overlap permitting trailing the load off gradually from one cam while the succeeding cam is at the same time gradually assuming it. The rise of the cam is even and constant between the intervals of overlap, and carries the water load forward without acceleration at even speed.

The power transformed by the cams is applied to the pistons in cylinders at any depth below the pump-head through two balanced sets of rods, hung one from each of the sliding yokes. By means of this arrangement it is always possible to keep the pumping engine at the surface no matter what the depth of the well or shaft may be. As the moving reciprocating parts throughout the entire equipment are in equilibrium at every part of the stroke, operation is effected upon much less power than ordinarily is required.

The pump shown at the Exhibition was an electric pumping engine operating at full speed while supported upon eight water glasses standing in pairs bottom to bottom upon an ordinary square saw-horse. It was not braced or supported in any manner. The pump was operating at 50 revolutions or 100 pump strokes per minute, and with so little vibration that a coin placed on edge on the pump frame remained without falling.

The non-pulsating triplex pumps are used for suction and pressure service, and are particularly adapted to water supply and fire protection of tall buildings and to municipal and corporate waterworks. The company use the duplex cam type upon all well work, with submerged pumping cylinder whenever possible, or the double chamber pump when suction is preferable.

All pumps made by the company are adaptable for direct connection with any kind of driving power. Valves of various types are used according to the nature of the substance to be pumped. The pumps are made to handle any liquid or semi-fluid matter.

CONSOLIDATION OF STREET CAR FRANCHISES.

During the past few weeks there has been quite a change in public opinion in respect to the British Columbia Electric Railway Company. For many weeks past, a Greater Vancouver committee has been at work trying to effect a consolidation of the street car franchises of the various surrounding municipalities. This city has the option of buying the system in the city proper in 1918, this will not give control of the franchises in outside places, where they extend for varying terms of years. Some of the aldermen think that because they have the option of buying that they have the street railway market cornered, and are standing firm. On the other hand, ratepayers are now taking up the matter, and at a meeting in Fairview voted against this attitude and suggested that the people be given a chance to express an opinion in the matter. Even those who stand for municipal ownership, confess that civic ownership of public utilities might obtain in instances, create irritation and that these franchise entanglements would be quite an incubus. It is realized that while the principle of civic ownership of public utilities might obtain in instances, this principle is subject to qualifications and the laws of general expediency. At first it was thought a twenty-five year term was too long for a general consolidation, but it is recognized by many that such a period is not out of the way if extensive enlargements are to be constantly carried on, for money cannot be had at a satisfactory price with a shorter term. Business men recently returned from the Old Country report that investors there are looking for a better rate of interest than formerly. That being the case, a short-term franchise would be of little use to the British Columbia Electric, which will need much money. With the feeling now obtaining, it is not improbable that the company and the city will be able to get together and agree to some mutual proposition, especially in view of the fact that at Point Grey there is a strong desire to have the street cars running once more.