

YORKTON COMPRESSED AIR WATER-WORKS SYSTEM.

F. T. McArthur B.Sc., Engineer for Yorkton, Sask.

During the summer of 1908 a compressed air water-works system was installed in the town of Yorkton, by J. L. White Company, of Sault Falls, South Dakota.

Until lately this is the only system of this kind in operation in the Dominion of Canada, although two other systems are now being installed and are possibly in operation by this time.

The entire pumping plant is confined to a brick building 60' x 40'. It consists of two double acting duplex piston pumps of 500,000 gallons' capacity daily, of the Fairbanks Company's make; one 10 x 10 double acting driven air compressor capable of displacing 150 cubic feet of free air per minute at the regular rate of speed, and sufficiently strong to



operate at that speed against a 100 lbs. per square inch pressure; two Fairbanks, Morse & Company's gasoline engines of 30 horse-power each, and two steel pneumatic compression storage tanks, cylindrical in shape, having a diameter of nine feet, and being 38 feet in length. These tanks are built of rolled steel of 60,000 lbs. tensile strength. All horizontal seams are double riveted, all girt seams single riveted, and heads staggard riveted with 34" rivets; the body sheets are 36", and the heads $\frac{1}{2}"$ thickness. The tanks are tested under an air pressure of 126 lbs. per square inch, and guaranteed to stand a working pressure of 65 lbs. per square inch, which is equivalent to a head of 150 feet.

The accompanying sketches will show the general layout of the plant. The system works exactly the same as the ordinary stand pipe system, the storage tanks taking the place of the stand pipe. The tanks are directly connected to the pumping main. They are first filled with compressed air to a pressure of about two atmospheres, and then the water is pumped into them against this pressure. As the water rises in the tanks, the air is compressed in the upper portion until when the tanks are about half full of water, the pressure has

reached 60 or 65 lbs. After the pressure has risen to about this point, pumping may be stopped and the expansion of air forces the water out of the tanks through the distributing mains. Each connection to the tanks is supplied with a valve so that one or both may be shut off from the main and water pumped direct.



In the opinion of the writer, this system has many advantages over a stand pipe system in this Northern climate where we are subject to such extremes of temperature.

The building is kept warm in winter by an ordinary coal stove, so that there is no trouble whatever with ice, and the water entering the main is warmer than would be the case with a stand pipe system. This to a large degree lessens the



danger of water mains freezing, even when the frost has penetrated the ground below the depth of the main. It has practically all the advantages of the direct pressure system without the necessity of continuous operation, thus allowing the use of cheaply operated gas and gasoline engines, at the same time retaining the large pumping capacity and the ability to give direct pressure should the occasion demand.