

and under each joint is a small metal shoe held out by German silver springs placed in a socket in the bottom of the ring channel. This packing gives steam tightness with the least pressure and wear of the rings against the cylinder. The piston is hollow to reduce weight.

The cylinder, as will be noted from the illustrations, is overhung from the main frame casting. This is much better than supporting the cylinder by bolting directly to the foundation or by wings, since it provides for free expansion and contraction without strains and distortion.

Exact alignment is secured by the heads fitting counterbores in cylinder body, and the front head being also turned to fit a counterbore in the engine frame. The valve chambers are in the cylinder heads in order to get them as close

to the cylinder cavity as possible, and thus reduce the length of the ports and clearance.

The steam and exhaust passages are separated from the main cylinder casting by cored spaces, which are packed with non-conducting material to prevent transmission of heat. Several sizes of cylinder may be fitted to one size of frame, so that is possible within limits to increase the power of the engine with the demand.

The joints between the cylinder and heads are provided with soft copper packing cylinders thirteen inches in diameter and less being cylindrical in form, while larger ones are rectangular.

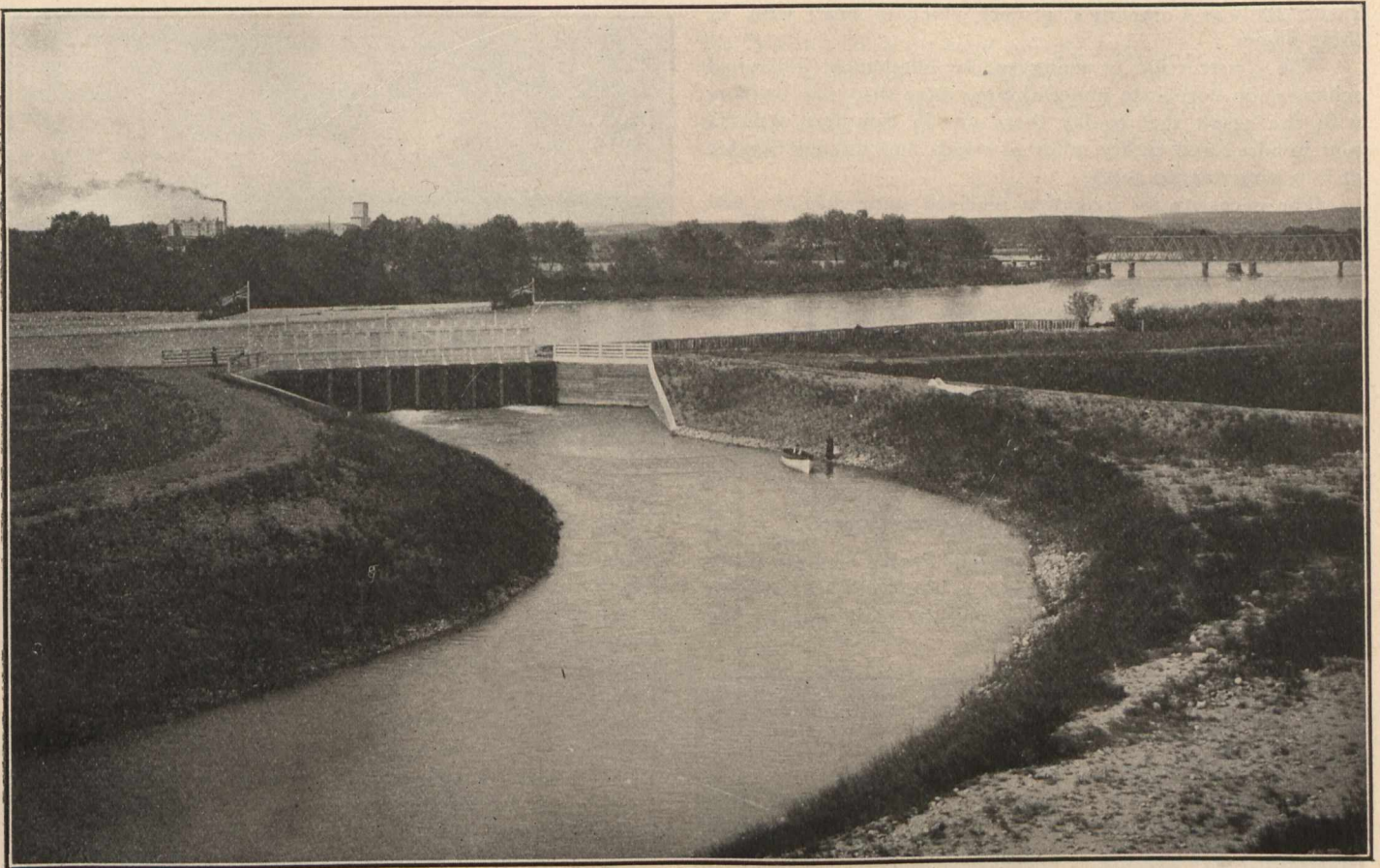
For further particulars, apply to the Atlas Engine Works, Indianapolis, U.S.A.

IRRIGATION WORKS OF THE CANADIAN PACIFIC RAILWAY, NEAR CALGARY, ALBERTA.

[On our recent 21 days' trip with the Canadian Society Civil Engineers, through Western Canada, we beheld many remarkable things; but we fully endorse the statement given to "The Montreal Daily Witness," October 1st, by Prof. C. H. McLeod, Secretary of the Society, that "from an engineering standpoint, by far the most interesting thing they saw, was the huge irrigation enterprise being constructed by the Canadian Pacific Railway in the neighborhood of Calgary." It is with pleasure therefore, that we here set forth a popular account of this unique piece of irrigation engineering. We are indebted to J. S. Dennis, Esq., Superintendent of Irrigation, C.P.R., Calgary, for the fine series of photographic views which we have reproduced, also, for the descriptive data. The map, and additional information, will appear in our account of the Engineers' Tour.—Editor.]

of the residents of these settlements, the country having been found specially adapted to the outdoor grazing of cattle, horses and sheep, but by degrees small amounts of cultivation were undertaken, especially along the valleys and on the bottom lands, and the fact proved that the country, during seasons of sufficient rainfall, was well adapted to the growth of grain, fodder and root crops.

A series of dry years, commencing in 1893, however, turned the attention of settlers to the possibility of aiding



Headgates, Main Canal; Calgary in the Distance.

Historical.

Irrigation as a means of assisting agriculture by the artificial application of water to growing crops is as old as civilization, but the adoption of this principle in Southern Alberta is a matter of comparatively recent years.

When the construction of the Canadian Pacific Railway was pushed across the great plains area of Canada in 1882-3, scattered settlement followed close upon its heels, and by the time the railway line had reached the Rocky Mountains, some of these settlements had been established in what is now the southern portion of the Province of Alberta.

For some years stock raising was the chief occupation

the growth of their crops by irrigation, and such marked success followed their efforts where ditches were constructed to irrigate small areas in the valleys, that general attention was directed to this method of extending settlement and insuring crop production.

The matter was then taken up by the Government, a well-considered and comprehensive law relating to the use of water for irrigation was passed, and a system of general surveys was undertaken to determine the source and volume of the water supply available for irrigation, and the location of areas where such water could be used to the best advantage.