fore, became the policy of the survey to continue the investigations at the stations already established and to establish other stations as soon as possible.

It was decided at first to place three parties in the field and the irrigation tract was divided into three districts. In each district there was one hydrographer and an assistant.

Each party was equipped with a team and light wagon and the necessary gauging and surveying instruments. It was aimed to supply each hydrographer with sufficient equipment for the proper execution of his work, but at the same time to keep the outfit as light as possible, so that the least possible time would be spent in travelling. For this reason no camp equipment was furnished except in the case of the Maple Creek District, where in some localities, accommodation could not be secured.

**Fig. 4.—Cauge Rod on the North Branch Branch at Mackie's Ranche.**

While every effort was made to establish regular gauging stations on all tne more important streams at as early a date as possible, it was impossible to accomplish this on many streams until the season was somewhat advanced. In the early part of the season, owing to numerous fluctuations in the flow, frequent discharge measurements had to be made at the gauging stations already established. After July the flow in the streams was lower and more regular and the hydrographers spent much more time in locating and establishing new gauging stations. In some cases, considerable time had to be spent in reconnaissance to locate the most suitable site for the gauging station.

With the data collected during the past season, some very valuable records of discharge and run-off have been compiled, and in a number of cases these records cover almost the whole of the open season. In some cases, for higher stages, there were scarcely sufficient data for complete records, but with few exceptions the computations are considered to be a very close estimate of the actual flow.

As the survey did not have a rating station, the manufacturers of the meters were asked to have them specially rated before being shipped. This they claimed had been done, but for some reason the rating tables were never furnished, although repeated efforts were made to secure them. The season was far advanced before it was definitely known that they would not be furnished and it was impossible to establish a rating station at that late date, so the general rating table for each particular type of meter had to be used. All meters should be tested from time to time, but, except as the result of accidents, it is very improbable that they will differ by any appreciable amount from the standard rating table while new and in good condition. A close watch of each meter and comparisons with other meters did not reveal any defects in any of the new meters.

While the records in this report show the regimen and behavior of the different streams during the past season and in several cases during part of the season of 1908, it must not be considered that sufficient information has been obtained and that the work at these stations may be discontinued. The precipitation and hence the flow of the streams or the run-off may be very different next season. A study of the general behavior of the streams should extend over a period of several years.

### Explanation and Use of Data.

The volume of water flowing in a stream is known as run-off. In expressing it various units are used, depending upon the kind of work for which the data are needed. Those used in this report are "second-feet," "acre-feet," "run-off per square mile," and "run-off in depth in inches," and may be defined as follows:—

"Second-foot" is an abbreviation for cubic foot per second, and is the body of water flowing in a stream one foot wide and one foot deep, at the rate of one foot per second.

The "acre-foot" is the unit of capacity used in connection with storage for irrigation work, and is equivalent to 43,560 cubic feet. It is the quantity required to cover an acre to a depth of one foot.

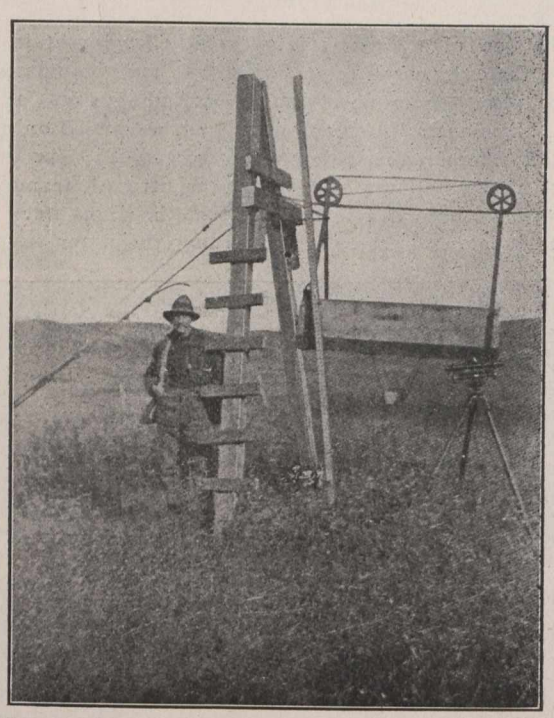

**Fig. 5.—Type of Support used at Peter's Ranche.**

The expression "second-feet per square mile" means the average number of cubic feet of water flowing each second from every equare mile of drainage area on the assumption that the run-off is uniformly distributed.

"Depth in inches" means the depth of water in inches that would have covered the drainage area, uniformly distributed, if all the water could have accumulated on the surface. This quantity is used for comparing run-off with rainfall, which quantity is usually given in depth in inches.

It should be noticed that "acre-feet and depth in inches" represent the actual quantities of water which are produced during the periods in question while "second-feet" on the contrary, is merely a rate of flow per second.