The success or failure of any county road that is constructed rests largely with the county surveyor. He, together with two viewers, in the case of a road built under the three-mile road law, must view and report on the petition to the county commissioners. If they grant the road, it is the duty of the surveyor to survey the road and prepare plans and specifications. He must design the bridges and culverts of sufficient size and strength to care for the needs of the road in question.

It is not only the surveyor's duty to look into the future to see that the road as designed and built will take care not only of present but of increased future traffic, but he must also have the ability to convince the viewers and tax-payers of this fact.

The surveyor must prepare his plans, profile and specifications so that there will be no question about getting the work done as intended. The engineer in writing specifications should bear in mind that his specifications will be interpreted by the inspector on the work and by the contractor or his foreman. They should be to the point and expressed in clear terms so there can be no chance for a disagreement or difference of opinion as to their meaning.

After the viewer's report has been filed with the county commissioners and the contract awarded, then the surveyor's real responsibility begins. With all of his precision in surveying, planning and writing the best specifications that it is possible to make, it will avail nothing unless he succeeds in getting the work done as he has previously planned.

The commissioners appoint a superintendent to look after the work. This superintendent or inspector may or may not be able to read blue prints or interpret specifications, yet he and the engineer must see that the work is built as specified. Regardless of the ability of the engineer, his work may be spoiled by an incapable inspector, unless he uses every precaution.

Regardless of whether the contractor is, or is not reliable, or whether the inspector is or is not competent, the responsibility of the engineer remains the same, for he must not
fail to furnish the tax-payers what they pay for and have a right to expect.

It may be of interest to the young engineer to hear and have discussed some of the problems that come up during the construction of a road, problems that must be solved without the aid of text books or slide rule.

He may have some ten or fifteen roads under construction, everything has been going fine, he has spent a busy half day at the end of the month in making estimates so the contractors may receive eighty per cent of their contract price on work done to date. After these have been carefully checked and filed with the county auditor, the surveyor feels relieved of a great responsibility and has about decided to attend a base ball game in the afternoon, when a contractor and inspector step into the office to report that two miles of the grade on their road is now completed, arrangements have been made to start placing material on the road next day, and that it will be absolutely necessary that the grade be checked immediately.

After checking the road through the first fill and over the first cut, you find that the hill lacks eighteen inches of being down to grade on the summit, and the fill lacks from six to ten inches of being up to grade at the place where you wanted to get above high water mark. Before you have time to get this information to the contractor, you are quietly informed by the owner of the land that he thinks the grade is satisfactory, and any way he thinks it unnecessary to have the hill cut any more, and has made up his mind that if there is any way to stop it, he will not have it done.

The contractor and inspector then explain to you that as long as those along the road are satisfied they see no reason why you should not be. Furthermore, they have passed the word out that they would start hauling next morning, that stone had been shipped to the unloading station, also that the railroad company had had trouble in getting a sufficient number of cars, and if they lost these cars, there would be no chance for any more soon. Further, the manager of the stone quarry had served notice that if he was to furnish the stone this season, shipments would have to be made at this time.

The man that drives the school hack over the road gives you the information that the education of some thirty pupils will depend on whether the stone is, or is not placed on this road before winter sets in, as it will be utterly impossible for him to make his trips around the detour when the roads break up.

The postmaster may call you up and announce that the
mail route over this highway will be discontinued unless this road is completed before a certain time. These are some of the things that will probably cause you to miss the ball game; yet they are problems that must be satisfactorily solved, and are a part of the responsibilities of the county surveyor in the building of county roads.

THE RESPONSIBILITIES OF THE COUNTY SURVEYOR IN THE BUILDING OF COUNTY ROADS

By Dave Harker,
Clinton County Surveyor.

The county surveyor's responsibilities in the building of county roads are many, but they can all be summed up in two principal responsibilities.

First of all, the surveyor must see that the road is correctly specified. The other two viewers for the road have more to do and say concerning the probable utility and benefits of the road. The surveyor is the engineering brains in the design of the road, and as such has many responsibilities in the correct design. It is not within this topic to discuss what are the proper methods as to size and shape of side ditches, types of culverts and their location, gradation of gravel or the depth and width of gravel. Whatever may be the beliefs of the surveyor, he should specify the road correctly as far as clearness and his views of engineering design are concerned.

When the road is ready for actual construction, the second of the surveyor's principal responsibilities is at hand, that is, he must see that the road is built to specifications. The superintendent of construction is appointed by the board of commissioners to superintend construction, but too often the man appointed knows little about how a road should be built. The surveyor should always take the final responsibility for the building of the road. The position of the superintendent of construction should be approximately that of an assistant to the surveyor. The surveyor is wise who assumes the responsibility in the beginning and has direction of the work, rather than to allow the superintendent of construction to run the job, and then hear the public say, "It was the surveyor's fault." No matter how hard the surveyor may try to shift the responsibility for the failure of a job to other shoulders, the public will place the credit where it rightfully belongs—upon the county surveyor.