

ARKANSAS HIGHWAYS



The Arkansaw Traveler
(One Hundred Years Ago)

APRIL
VOL. 2 1925 NO. 4

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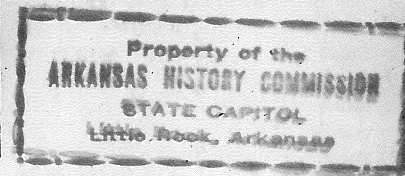
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ARKANSAS HIGHWAYS



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VOL. II.

APRIL, 1925

NO. 4

Present and Future Practice in Road Design

O. L. Hemphill, Assistant State Highway Engineer.

It is only a comparatively short time that road construction, as we know it, has been in progress to any considerable extent in the United States; and, during that time, ideas of design and types have been constantly changing, each year bringing changes in width, thickness and other features. The principal reason for these continual changes in design is the constant increase in number, speed and weight of vehicles which use these highways.

In the past, and even right up to the present date, design practice has not kept up with traffic conditions; but really has been a step behind. This has not been due to short-sightedness, as no one really could know what the traffic increases would be, funds were usually limited, and mileage has been such an important consideration that a road builder can hardly be blamed for designing and building for a reasonable, probable traffic increase only, and not for the improbable increase in traffic which actually happened.

Whether future traffic increase will be as unexpectedly rapid as it has been in the past remains to be seen. Road builders now plan for the future, but whether their vision is broad enough to visualize future traffic, or whether the improved designs will merely keep a step behind traffic conditions, will be determined by future developments.

One of the first needs occasioned by added traffic is wider roads. The day of the nine-foot width of surface is practically gone, as very few roads can be used strictly for one way traffic; and, even if they could be, the wear would be excessive because of the excessive concentration of traffic. In some places where the traffic is light a twelve-foot width of surface, if the surface is of gravel, is justified. If traffic is heavy enough to build a higher type of road it probably is too heavy for a twelve-foot width.

In the scale of widths, fourteen and sixteen feet come next. These are really wide enough for only one line of traffic; but are sufficiently wide to pass other vehicles at occasional intervals without discomfort. When, however, vehicles are so numerous that they must be met and passed at frequent intervals, the sixteen-foot width is hardly sufficient to pass in safety when we consider the speed at which automobiles are now operated.

When traffic conditions reach this stage on any road it becomes necessary to provide for two lines of traffic, and the minimum width of surface for two lines of traffic should be eighteen feet. This allows two lines of traffic, but since all vehicles do not move at a uniform rate of speed, there are times when the road contains two lines of vehicles moving in the same direction. If traffic in both directions is so heavy that the faster vehicles have no opportunity to pass the slower ones because of the density of traffic in the opposite direction, then eighteen feet is too narrow, and the traffic is such that a road sufficiently wide for three lines is needed. This state has no roads which have this amount of traffic regularly, although on special occasions, roads out of Little Rock and some of the other larger towns are congested to such an extent that the eighteen-foot roads are too narrow. While this condition is only occasional at the present, the time is not far distant when traffic on some of these roads will require roads wide enough for three lines.

Considerable traffic congestion is caused by routing through roads over the principal streets of towns. The time is coming when towns will seek to avoid main highways over their principal streets, and will endeavor to divert them to side streets. They will work just as strenuously to this end as they now work to pull the highway rout-

ing over Main street. This is a matter of location and not of design, however.

Until about three years ago the Arkansas standard embankment was twenty-two feet in width. Then came the twenty-four foot minimum width on primary roads, and recently we have planned new construction on either primary or secondary roads with a minimum embankment width of twenty-four feet. Present indications are that in the near future the Bureau of Public Roads will require that Federal aid projects, on primary roads at least, be built with a minimum embankment width of twenty-six feet. For an eighteen-foot surface, the twenty-four foot embankment is hardly sufficient, and where there is a probability that traffic will soon increase enough to justify a wider road for three lines of traffic, the twenty-six foot embankment is, of course, entirely too narrow, and the minimum width is thirty feet. Several of the roads in this state are now being built with thirty-foot embankments. The Little Rock-Hot Springs road and the North and South road in Mississippi county are in this class. It is obvious that road bed and structures can be built thirty or thirty-two feet in width in the first place more cheaply than can be done by first building to a lesser width and widening later.

The increasing weight of vehicles is affecting road design in the matter of thickness. Common practice in the past has been to construct gravel roads with a compacted thickness of six inches, bituminous macadam roads with a base thickness of from five to six inches, and asphaltic concrete roads on stone base with a base thickness of from five to six inches. The state's mileage of concrete road, although growing, is relatively small. Some of the few earlier concrete roads in the state were built with a uniform thickness of six inches. Later, some were built six inches thick at the edges and seven and one-half or eight inches thick at the center; and the type now being constructed is the so-called "Bates" type, which has the thickest section at the edge. More will be said of this type later.

Because of the excessive maintenance cost, gravel roads are not suitable where the volume of traffic is heavy. They are, however, well suited for traffic conditions on a large proportion of the Arkansas highways, and because of the wide distribution of road gravel in this state and the consequent economy of its use, this type of road will, and very properly should be the kind most constructed in this state for a number of years to come. Where the road is properly drained and where the subgrade is in the proper condition at the time the gravel is placed, a six-inch thickness of compacted gravel is, in most cases, sufficient to sustain the loads which will pass over it. Unless it is given constant maintenance, however, a gravel road wears rapidly, so that unless maintained, a six-inch depth of gravel may soon wear to a four-inch depth. This department, during the past year, has constructed gravel roads, if sufficient funds were available, with a compacted thickness at the center of from seven to eight inches, or even more where conditions warranted. By making the thickness less at the edge, which does not receive so great a volume of traffic, the gravel road eight inches thick at the center requires very little more gravel than the one of six inches uniform thickness.

For the asphalt surface roads on stone base, the tendency is toward an increased base thickness. The Bureau of Public Roads now requests a compacted thickness of eight inches for crushed stone base where asphaltic ma-

cadam or asphaltic concrete is to be used as a surface, although for some projects they will approve a compacted base thickness of six and one-half inches. In most cases eight inches is more than necessary to care for present traffic, but would be necessary if loads are allowed to increase as they have in the past. Where funds are limited, however, it is sometimes difficult to see the wisdom of increasing the thickness over that which will not only be sufficient for present traffic and loads, but even for some increase. This added expense is sometimes questionable, especially when there is such a large mileage of unimproved roads which should be built.

In connection with increasing loads, the question arises as to whether we are to save our highways by restricting loads to the limits which the highways can carry without damage, thus, as some insist, retarding and handicapping highway transportation; or are we to allow the loads to increase without restriction to the point where constant reconstruction of newly completed roads is necessary, and where each new road built must be stronger than the last, for so long as loads are unrestricted they will always be a little greater than the roads can carry without damage, and each stronger road will be the cause of a heavier load. This matter, however, is a subject of economics and not of design.

Coming back to the subject of stone base thickness for asphalt surface roads, it is my opinion that a part of the base thickness might be saved by treatment and preparation of the subgrade. In other words, in such places as base failure occur, six inches of base with a properly treated subgrade might do as well as eight inches with no subgrade treatment. In some cases this might cost more than the additional stone, in most cases less, and the matter is worthy of study and consideration in the construction of every road of this type.

For black top roads on concrete base, the tendency in this state has been to use a five or six inch base of 1:3:5 or 1:3:6 mix, with most of the more recently constructed roads using the thicker base and the richer mix. This tendency toward a thicker base and richer mix is well justified in view of the results obtained in the tests on the Bates Experimental Road in Illinois. These tests were probably the most extensive tests of road sections ever carried out under actual traffic conditions, and were made in 1922 and 1923. The experiments included sections of Topeka mix on concrete base of different thickness with both 1:3:5 mix and 1:2:3½ mix. At the end of the 1922 season no marked difference was shown between the two mixes, certainly much less difference than existed between the compressive strength tests of the cylinders from the two mixes. In 1923, however, when the tests were continued with heavier loads, the roads with the richer mix of base showed much better resistance than those with the leaner mix. As to the different thicknesses of the base, the thicker bases, as would be expected, showed a proportionately greater strength, not so much on the initial corner breaks, but on the sizes of the loads and the applications required for destruction.

Returning to the subject of concrete roads, we apparently know less, or until recently knew less about this than any other type. Ever since there has been any considerable amount of concrete pavement constructed, each year has brought out new developments in some of the many features

(Concluded on Page Twenty-one.)

County Re-Classification and What it Really Means

Actual Figures Showing Effect of Act No. 147.

In the March issue of *Arkansas Highways* there was given a statistical table showing the amounts due on bonds by road districts in the several counties of the state, and the amount of state relief for 1925 and 1926 under the Harrelson Act. This table, compiled by Van B. Sims, state comptroller, has been modified as to certain counties under Act No. 147 of the 1925 General Assembly, which re-classified them as to the percentage of their bond relief, and the following table, prepared by R. C. Limerick, state highway engineer, shows the actual dollars and cents involved in the changes made.

COUNTY	LAST CLASSIFICATION		AMOUNT RETURNED		AS AMENDED BY ACT NO. 147		AMOUNT RETURNED	
	Interest and retirement on bonds	County Highway Fund	Interest and retirement on bonds	County Highway Fund	Interest and retirement on bonds	County Highway Fund	Interest and retirement on bonds	County Highway Fund
Baxter	75%	25%	\$ 13,117.50	\$ 4,372.50	75%	25%	\$ 13,117.50	\$ 4,372.50
Benton		100%		62,070.00	90%	10%	55,863.00	6,207.00
Cleveland	25%	75%	5,247.75	15,743.25	50%	50%	10,495.50	10,495.50
Columbia	25%	75%	11,844.00	35,532.00	45%	53%	21,319.20	26,056.80
Dallas		100%		24,696.00		100%		24,696.00
Faulkner	50%	50%	23,697.00	23,697.00	75%	25%	35,545.50	11,848.50
Fulton	50%	50%	9,573.00	9,573.00	60%	40%	11,482.60	7,658.40
Hempstead	25%	75%	13,526.25	40,578.75	50%	50%	27,052.50	27,052.50
Independence	25%	75%	10,262.25	30,786.75	50%	50%	20,524.50	20,524.50
Jackson	75%	25%	32,674.50	10,891.50	90%	10%	39,209.40	4,356.60
Lafayette	50%	50%	13,312.50	13,312.50	50%	50%	13,312.50	13,312.50
Lincoln		100%		32,142.00	75%	25%	24,106.50	8,035.50
Logan		100%		44,286.00	10%	90%	4,428.60	39,857.40
Lonoke	90%	10%	51,464.70	5,718.30	75%	25%	42,887.25	14,295.75
Mississippi		100%		81,015.00	75%	25%	60,761.25	20,253.75
Pope	75%	25%	34,866.00	11,622.00	90%	10%	41,839.20	4,648.80
Yell	50%	50%	21,961.50	21,961.50	50%	50%	21,961.50	21,961.50
			\$241,546.95	\$467,998.05			\$443,911.50	\$265,633.50
			467,998.05				265,633.50	
			\$709,545.00				\$709,545.00	

Hope-Camden Road Plans are Forming

Recent Conference Results in Definite Action.

Delegates from the Hope Chamber of Commerce and Camden Chamber of Commerce met recently at Waterloo, Nevada county, 22 miles southeast of Hope, in a conference for the discussion of plans for the building of the proposed highway from Hope to Camden by way of the Nevada county oil field.

The delegates from Hope were Geo. W. Robinson, president of the chamber of commerce; Secretary Albert Connerly, W. Y. Foster Sr., Richardson Ayers, J. P. Brundidge, R. M. Patterson, L. A. Foster, Henry Watkins, W. P. Agee Jr., W. M. Cantley and Foster Martin. Camden delegates were A. L. Morgan, president of the chamber of commerce; Secretary R. C. Stewart, Senator R. K. Mason, D. V. Snow, County Judge of Ouachita county W. W. Brown, W. R. Barker, H. B. Lide, R. L. Boddy, County Agent Willis and Geo. Ames. Representatives of Waterloo were Dr. E. E. Warmack, Dr. T. T. Mendenhall and Dr. E. E. Shell.

It was learned that no federal aid could be obtained for this road as the state's quota of 5,000 miles has already been provided for in the state's highway program. The improvement district idea was thought to be impractical and

the only way the road can be built is through state aid, and this plan was adopted. The proposed highway has already been designated by the highway department as a unit of the system of state highways, and state aid in the project is expected.

The plans are to be turned over to the state highway engineer July 1. Concrete action was taken in adoption of a motion that three committees be appointed, one from the Hope Chamber of Commerce, one from the Camden Chamber of Commerce, the third being Drs. W. A. Waters and E. E. Warmack to represent Waterloo and vicinity, the three committees to secure the co-operation of the county judges of Hempstead, Ouachita and Nevada counties and to further develop plans for building the road.

The proposed road will be of great importance to the business interests of Hope and Camden, to the farmers and land owners along the proposed route and to the development of the oil field which has now about 30 producing wells in the proven area, and this area is being extended. Waterloo is only about two years old and is rapidly growing in size and population.

Many Highway Measures Passed by Assembly

A Legislative Resume, Concluded from March Issue.

In the March issue of *Arkansas Highways* there was given a comprehensive resume of legislation affecting the highway program of the State by the 1925 General Assembly.

At the time that issue went to press, however, there were still a number of measures awaiting the governor's signature, and it was necessary to wait for this number to complete the listing of such acts.

By combining the list of acts given in the March issue with that given below, readers of *Arkansas Highways* will have a complete list of all new laws affecting the highway situation in the State. As will be seen, most of the measures were of minor or local importance only.

Synopsis of Highway Acts.

Act No. 215—To enable certain road improvement districts to receive federal aid and on petition of a majority in numbers, acres or value of the property owners, to make additional assessments of benefits, issue and sell additional bonds and to construct, improve and maintain the public roads and bridges.

Act No. 223—To make the county judge of Columbia county ex-officio road and bridge commissioner.

Act No. 225—To make the county judge of Lawrence county ex-officio road and bridge commissioner at a salary of \$2,400.

Act No. 226—To make the county judge of Randolph county ex-officio road and bridge commissioner at a salary of \$1,000.

Act No. 228—To amend Act No. 5 of 1923, granting Highway Commission power to make rules for regulation of traffic on state highways, to fix duties of persons employed by the Commission to issue necessary bulletin and publications, and to provide that metal disc signs may be erected along highways to convey road information furnished by the Highway Commission.

Act No. 237—In aid of Carlisle-Hamilton Road Improvement District No. 14, Road Improvement District No. 13 and Humnoke Road Improvement District No. 9 of Lonoke county, to permit an extension of roads in said district, to make reassessments of benefits and issue bonds for same.

Act No. 242—To direct the county court of Sharp county for the southern district to set aside at the July term, 1925, twenty per cent of the revenue received from automobile and gasoline tax, to retire bond coupons and accrued interest in Road District No. 1 from Strawberry river, by Evening Shade to Cave City, and to set aside funds to pay for preliminary expense in surveying route for North Arkansas Highway Improvement District No. 3 in Sharp county.

Act No. 244—To amend Section 5 of Act No. 202, approved March 1, 1921, providing for free labor on the highways of Lonoke county and substituting in lieu thereof a per capita tax of \$4.00 per annum.

Act No. 245—To grant the town of Waldo fifty per cent of the road taxes collected therein.

Act No. 246—To grant the cities of Benton and Gould all of the road taxes collected therein for street purposes.

Act No. 247—To make the county judges of Saline and Faulkner counties ex-officio road and bridge commissioners at a salary of \$2,400 per annum, respectively.

Act No. 250—To grant the city of Hartford all road tax collected in the corporate limits for street purposes.

Act No. 253—To make the county judge of Desha county ex-officio road and bridge commissioner at an additional salary of \$600.

Act No. 255—To make it unlawful for any driver of a motor vehicle to drive upon a railroad track at a public highway or municipal street intersection or grade crossing, that has been designated as hazardous, without first bringing vehicle to a full stop at a distance of not less than 10 feet nor more than 50 from the nearest track, and then and there looking and listening for approaching trains.

Act No. 259—To confirm proceedings of Road Improvement District No. 1 of Searcy county and to provide for assessments of benefits in the organization of said district.

Act No. 261—To permit road improvement districts embracing lands situated in more than five counties to have confirmation of their title to any lands sold to them made by chancery court and to provide for payment of costs.

Act No. 265—To authorize road improvement districts having outstanding bonds to issue refunding bonds provided same shall not bear a greater rate of interest than six per cent, shall not be sold for less than par and shall not run for a period exceeding three years.

Act No. 268—To appropriate \$40,194 to pay state's part of cost of road running through the grounds of the Arkansas Polytechnic College at Russellville in Road Improvement District No. 2.

Act No. 287—To provide that after July 1, 1925, the expenses of the collection of the gasoline and motor oil tax shall be paid out of the General Revenue Fund instead of the State Highway Fund.

Act No. 288—To appropriate out of money paid into the State Treasury by the United States government, into the Federal Aid fund, \$3,000,000 for the fiscal year ending June 30, 1926, and \$3,000,000 for the fiscal year ending June 30, 1927, for the construction and improvement of state highways for which federal aid funds may be allotted.

Act No. 290—To provide for the construction of an improved road from the towns of Tucker and Varner to the state farms located near such towns, making an appropriation of \$12,000 for gravel for the Tucker road and \$15,000 for the Varner road.

Act No. 346—To provide that the time for the redemption of lands situated in any road improvement district sold in default of payment of road tax shall be extended for three years in addition to the period of redemption heretofore fixed for the redemption of land for the non-payment of such annual assessment, the counties of Pulaski, Polk, Sharp, Sebastian, Jefferson, Chicot, Pope, Lawrence, Randolph, Lee, Phillips, Stone, Independence, Cleveland, Crittenden, Lincoln, Dallas, Drew and St. Francis are exempted.

Act No. 353—To amend Act No. 126 of 1923, amend-

(Concluded on Page Nineteen.)

The Relation of Improved Highways to Home Life

By HENRY SCHNEIDER, Little Rock, Arkansas.

TWO of the most important factors of home life are economic and social activity. The first factor has to do with one's financial welfare and the second, which deals with a very large scope, is concerned with religious life, school life, health, and recreation.

The economic effect of improved highways is readily seen by the advantages they offer to the farmer in selling his produce. A poor market may be near his home. If the roads are bad, he will haul to the nearest town and take a low price for his goods. A good market may be farther away; but, with improved roads, he can reach it more easily and quickly than he can reach the nearer market over bad roads. Consequently, with an increase in his earnings, he is able to improve his farm, install modern conveniences in his home, and offer additional advantages to his children—all of which go to make home life more pleasant.

An excellent example of the economic effect of improved highways may be found in a brief survey of Pulaski county, the community in which I have always lived. Practically all the main highways of the county have been paved in the last five years, and it is interesting to notice the improvement of the homes and farms along these good roads. Many well built, attractive homes, equipped with nearly every modern convenience, have taken the places of the small, unadorned farm houses.

In considering the effect of improved highways on social activity; it is well to discuss each phase of this factor separately. No American home is complete unless it has some connection with the church. In establishing this relation between home and church, good roads play an important part. In districts where the highways are improved, it is more convenient for the people to attend places of worship. In disagreeable weather the attendance is but slightly affected; whereas, with poor roads, services are oftentimes suspended for weeks. People, spiritually awakened, naturally try to lead fruitful lives and endeavor to rear their children in a Christian manner.

The importance of education to home life is at once made manifest by the fact that intelligence fosters cleaner and better living. The greater part of one's education is received in school, and larger and better schools follow the good road movement as surely and logically as any effect follows a cause. This is clearly shown by a case in my own community, where the consolidation of several schools immediately followed the improvement of the Frazier Pike. Before this road was improved, it required thirteen hundred dollars to maintain a small school eight months of the year. After the road was built, several such schools in the surrounding vicinity were consolidated into a larger and better equipped institution. This condition was brought about only by the fact that improved highways make it possible to convey children easily over long distances at public expense. The attendance is more regular, for the child has before him a pleasant morning ride in a bus, which also protects him from bad weather. His eagerness to attend school will induce him to work better.

Good health and recreation are no less important to the home than education, for they bring happiness and contentment. Here, again, improved highways have their good

effect. Bad roads, not being well drained, furnish breeding places for disease after rainy weather. Improved highways have practically no dust and are well drained. Isolation caused by bad roads is responsible for the prevalence of insanity among many of the farmers' wives and daughters. The recreation and pleasure which good roads offer change this isolation to close association. The farmer is able to take his family to town easily and often. His neighbors are brought closer to him; consequently he has the pleasure of their friendship.

Taking into consideration the effect of improved highways on the factors that make up home life, it may well be said that they bring prosperity, clean living, happiness, and contentment to the home.

VAN BUREN-ALMA PROJECT STARTED.

Work on the new state highway connecting Van Buren and Alma, an \$80,000 project, including 10 miles of gravel and a new bridge over Clear Creek, will be completed during the present season, it has been predicted, as a result of a recent conference between County Judge R. S. Wilson and R. C. Limerick and W. W. Mitchell of the State highway department.

Under present plans, bids are to be let June 1, and construction started as soon thereafter as possible.

The New Highway Law

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"The Arkansaw Traveler" and His History

By Dallas T. Herndon, Secretary, Arkansas History Commission.

For our front page cover this month we have selected an old wood cut reproduction of "The Turn of the Tune," the second of the two "Arkansaw Traveler" pictures painted by the late Edward Payson Washburn. Mr. Herndon here gives the true history of the painting and the song and dialogue which inspired it. Next month, on our front cover, we will use "The Arkansaw Traveler," up to date, showing the contrast which 100 years have wrought.—EDITOR.

FOR almost 100 years, fiddlers throughout the United States, particularly in the rural sections, have taken delight in playing an air known as "The Arkansaw Traveler," but few of them have known anything of its origin.

It is not possible for us to determine what individual may have been the original composer of the music, but the fact is pretty well established that Sanford C. Faulkner was the man who brought the air into prominence and has been handed down in history as the original "Arkansaw Traveler."

Sanford C. Faulkner was born in Georgetown, Kentucky, March 3, 1803. In 1829 he came to Arkansas and located in Chicot county, where he became interested in cotton planting. Ten years later he removed to Little Rock. During the Civil war he was captain of ordnance at the arsenal until Little Rock was occupied by the Federals in 1863. He then went to Texas, where he remained until the close of the war. Returning to Little Rock, he again engaged in business as a planter until a few years before his death, when he sold his two plantations and lived practically retired from active business. He died on August 4, 1874. In a notice of his death, the Gazette of the 5th said:

"It is well known throughout the Southwest that Colonel Faulkner was the original impersonator of the 'Arkansaw Traveler,' and it was his pride to be known as such. The story, it is said, was founded on a little incident which occurred in the campaign of 1840, when he made the tour of the state in company with the Hon. A. H. Sevier, Governor Fulton, Chester Ashley and Governor Yell. One day, in the Boston Mountains, the party approached a squatter's house for information of the route and Colonel 'Sandy' was made-spokesman of the company, and it was upon his witty responses the tune and the story were founded. On the return to Little Rock, a grand banquet was given in the famous 'bar-room' which used to stand near the Anthony House, and Colonel 'Sandy' was called on to play the tune and tell the story. Afterward it grew in popularity. When he went to New Orleans, the fame of the 'Arkansaw Traveler' had gone before him, and at a banquet, amid clinking glasses and brilliant toasts, he was handed a violin by the then governor of Louisiana and requested to favor them with the favorite Arkansas tune. At the old St. Charles Hotel a special room was devoted to his use, bearing in gilt letters over the door, 'Arkansaw Traveler.'"

Others have tried to claim the honor of being the originator of the "Arkansaw Traveler," but the above is the generally accepted version of its origin. There has always been more or less objection to both tune and dialogue among certain people of Arkansas, on the ground that it has been an unfortunate advertisement for the state. It is true that the rough humor in the banter between the traveler and the squatter was no more typical of Arkansas than any other frontier in early days and, while many may

regard it a true representation of the Arkansas squatter, the more intelligent have learned to look upon it merely as a piece of comedy.

Some years after the tune and story became famous, Edward Payson Washburn, a son of Rev. Cephas Washburn, painted the picture of the "Arkansaw Traveler." The artist was born at the old Dwight Mission in 1831, and was about twenty-five years old when he painted the picture. In that painting the "traveler" seated on his horse is Colonel Faulkner. Whether the picture was painted from memory, or whether the artist had a daguerrotype of Colonel Faulkner is not definitely known, but the picture is said to be a good likeness. The original painting was given by Mr. Washburn to his sister, who in turn handed it down to her daughter, Mrs. George Black, of Russellville, by whom it has been carefully preserved. Another picture, commenced by Washburn and left unfinished at the time of his death in 1860, was finished by another. It represents the "Turn of the Tune," where the traveler is sitting on his horse, scraping out the second part, while the squatter is dancing in his glee. These two pictures, hung side by side, have decorated the walls of many a tavern and bar-room of the Southwest.

The dialogue supposed to accompany the tune, was no doubt the work of various persons, though it is probably based upon the incident at the squatter's cabin in the Boston Mountains in 1840. It is as follows:

An Arkansaw Traveler, who had become lost, discovered a squatter, seated on an old whiskey barrel near the door of his cabin, and playing a fiddle, when the following dialogue ensued, the squatter still continuing to play the same part over and over:

Traveler—Hello, stranger.

Squatter—Hello, yourself.

T.—Can I get to stay all night with you?

S.—You can get to go to hell.

T.—Have you any spirits here?

S.—Lots of 'em. Sall saw one last night by that ole holler gum and it nearly scared her to death.

T.—You mistake my meaning; have you any liquor?

S.—Had some yesterday, but Olé Boss he got in and lapped all uv it out'n the pot.

T.—You don't understand me. I don't mean pot liquor. I'm wet and cold and want some whiskey. Have you got any?

S.—Oh, yes—I drank the last this morning.

T.—I'm hungry, haven't had a thing since morning. Can't you give me something to eat?

S.—Hain't a damned thing in the house. Not a mouthful of meat, or a dust uv meal here.

T.—Well, can't you give my horse something?

S.—Got nothin' to feed him on.

T.—How far is it to the next house?

S.—Stranger, I don't know, I've never been thar.

T.—Well, do you know who lives here?

S.—I do.

T.—As I'm so bold, then, what might your name be?

S.—It might be Dick and it might be Tom; but it lacks a damned sight of it.

T.—Sir, will you tell me where this road goes to?

S.—It's never been any whar since I've lived here, it's always thar when I git up in the mornin'.

T.—Well, how far is it to where it forks?

S.—It don't fork at all, but it splits up like the devil.

T.—As I'm not likely to get to any other house tonight, can't you let me sleep in yours, and I'll tie my horse to a tree, and do without anything to eat or drink.

S.—My house leaks. Thar's only one dry spot in it, and me and Sall sleeps on it. And that thar tree is the ole woman's persimmon, you can't tie to it, 'case she don't want 'em shuk off. She lows to make beer out'n um.

T.—Why don't you finish covering your house, and stop the leaks?

S.—It's been raining all day.

T.—Well, why don't you do it in dry weather?

S.—It don't leak then.

T.—As there seems to be nothing alive about your place but children, how do you do here, anyhow?

S.—Putty well, I thank you, how do you do yourself?

T.—I mean what do you do for a living here?

S.—Keep tavern and sell whiskey.

T.—Well, I told you I wanted some whiskey.

S.—Stranger! I bought a bar'l mor'n a week ago. You see me and Sall went shares. After we got it here, we only had a bit tweenst us, and Sall, she didn't want to use hern fust, nor me mine. You see I had a spiggin' in one end, and she in tother. So she takes a drink out'n my end, and pays me the bit for it; and then I'd take un out'n hern, and gives her the bit. Well, we's getting along fust-rate, till Dick, d—d skulking skunk, he borne a hole on the bottom to suck at and the next time I went to buy a drink, they wurnt none thar.

T.—I'm sorry your whiskey's all gone; but, my friend, why don't you play the balance of that tune?

S.—It's got no balance to it.

T.—I mean you don't play the whole of it.

S.—Stranger, can you play the fiddul?

T.—Yes, a little sometimes.

S.—You don't look like a fiddler, but ef you think you can play any more onto that thar tune, you kin just git down and try.

(The traveler gets down and plays the whole of it.)

S.—Stranger, take a half a dozen cheers and sot down. Sall, stir yourself round like a six-horse team in a mud hole. Go round in the holler, whar I killed that buck this mornin', cut off some of the best pieces, and fotch it and cook it for me and this gentleman directly. Raise up the board under the head of the bed and git the old black jug I hid from Dick, and give us some whiskey; I know thar's some left yit. Till, drive Old Bose out'n the bread tray, then clime up in the loft, and git the rag that's got the sugar tied in it. Dick, carry the gentleman's hoss round under the shed, give him some fodder and corn, as much as he kin eat.

Til.—Dad, thar ain't knives enouff for to sot the table.

S.—Whar's big butch, little butch, old case, cob-handle, granny's knife, and the one I handled yesterday? That's 'nuff to sot any gentleman's table with, without you've lost um. D—n me, stranger, ef you can't stay as long as you please, and I'll give you plenty to eat and drink. Will you have coffee for supper?

T.—Yes, sir.

S.—I'll be hanged if you do tho', we don't have nothin' that way here, but Grub Hyson, and I reckon it's mighty good with sweetnin'. Play away, stranger, you kin sleep on the dry spot tonight.

T.—(After about two hours' fiddling.)—My friend, can't you tell me about the road I'm to travel tomorrow?

S.—Tomorrow! Stranger, you won't get out'n these diggins for six weeks. But when it gits so you kin start, you see that big sloo over thar? Well, you have to git crost that, then you take the road up the bank, and in about a mile you'll come to a two acre and a half corn patch, the corn is mitely in the weeds, but you needn't mind that, jist ride on. About a mile and a half, or two miles from that you'll come to the damndest swamp you ever struck in all your travels; it's boggy enough to mire a saddle blanket. Thar's a fust-rate road six feet under thar.

T.—How am I to get at it?

S.—You can't git at it nary time, till the weather stiffens down sum. Well, about a mile beyant, you come to a place whar thur's two roads. You kin take the right hand ef you want to, you'll follow it a mile or so, and you'll find it's run out; you'll then have to come back and try the left, when you get about two miles on that, you may know you are wrong fur there ain't any road thar. You'll then think you are mighty lucky ef you kin find the way back to my house, where you can come and play that tune as long as you please.

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Logan County is Proud of the New Highway

Old Bugbear to Tourists Is Removed by State Highway Department.

The graded road bed of the state highway from the Sebastian county line to Waveland in Yell county, has been connected up with the opening of the gap between Booneville and Magazine and the one between Blue Mountain and Waveland.

The work on the highway in this section consists in grading the road bed with material found on the right of way, except when building culverts and bridges.

The highway from Blue Mountain, Logan county, to Waveland, Yell county, a distance of six miles, passes through one of the worst sections for road construction in this part of the state.

Much of the route between these two towns passes over huge deposits of waterworn stones, such as are found in the beds of mountain torrents or glacier drifts, covered by only a few inches of soil.

The Hall Lane, a part of this sector, has been a bugbear to travel for 50 years, according to the statement of old settlers. Driving through this lane was like driving over a mass of balls. When the road crew assembled to begin work here an old settler remarked, "This lane has been this way for 50 years and always will be." Now cars glide over the new road bed as evenly as a floor, and the old Hall Lane is no more. Such marvelous changes for the better in road conditions are making many friends for good roads among the rural population, who at first regarded it as only "a grafting proposition for politicians."

This part of the highway crosses the brakes at the foot of Magazine mountain and is a creditable piece of road construction, over many difficulties. The work was done under the personal supervision of W. C. Fry, who

is superintendent of state highways for Logan and Yell counties, and he states that the labor cost has been about \$175 per mile for grading this sector, which appears to be a very economical amount for the excellent road bed obtained. The rural population had been told that it would cost thousands of dollars to build good roads through this section, but such a good beginning at so low a cost is winning their confidence and gaining their support for good roads.

The gap between Booneville and Magazine was constructed under the supervision of George M. Martin, supervisor of state highways for South Logan county, and is an excellent piece of road construction. It passes through the most beautiful farming section adjacent to Booneville.

Pleasure parties leaving Booneville now speed away to Waveland, 20 miles distant, and return in two hours. Unmindful of the glacier drift beneath the wheels of their cars, they gaze at the jutting spurs, the dark chasms, and are thrilled with the grandeur of the towering cliffs of Mount Magazine; the loftiest structure in the Mississippi valley.

In a commercial way, Booneville, last year, profited much from road improvement in this section of the country. With the completion of this part of the highway, and the continued improvement of the county roads, it is believed that the trade territory of Booneville will be increased 25 per cent this year.

The advantages already reaped from better roads are making this part of the country enthusiastic in its support of the good roads system.

This highway is a Secondary Federal Aid road.

ARKANSAS PROJECTS APPROVED.

Among the Arkansas projects recently approved by the Federal Bureau of Public Roads for Federal aid are the Pope-Lewisville highway in Hempstead and Lafayette counties; the Nettleton-Lake City road in Craighead county, and the Wynne-Harrisburg road in Cross and Poinsett counties.

The estimate of cost for the Pope-Lewisville project is \$130,000; for the Nettleton road, \$28,600, and the Harrisburg road, \$225,000. Under certain conditions, the Fed-

eral government may bear as much as half of this burden, the remainder being taken care of by adjacent property owners, and by road users, through the State gasoline tax.

The building of a bridge across the Red river at Fulton will be a big boost for the whole county and it will pay itself out in a year or two, paid by those who use it. A fair, square deal from every standpoint.—*Ozan (Ark.) Press.*

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Changes Made in Personnel of Highway Commission

Governor Terral Names Two New Members.

On Thursday, April 16, the personnel of the honorary highway commission was changed when Charles E. Moyer of Little Rock, and Ed Kendall of Marble, Madison county, qualified under appointment of Governor Tom J. Terral, to succeed W. Y. Foster of Hope and J. S. Turner of Ozark, whose commissions expired February 1.

The new commission sat with the old in an adjourned session of the regular March meeting, passing upon a number of routine matters.

Mr. Moyer is mayor of the city of Little Rock and for-

mer county judge of Pulaski county. During the recent General Assembly he served as legislative advisor to Governor Terral.

Mr. Kendall is one of the leading farmers and business men of Madison county. Both appointments are for four-year terms.

Hold-over members of the honorary commission are R. H. Wolfe of Tillar, and Theodore Maxfield of Batesfield. Joe A. Bailey of Prescott is secretary.

"Early Start on Roads"

Fort Smith Southwest-Times Record.

The state highway department has sent out checks totaling \$603,759.38 to various counties of Arkansas, in partial payment of the July 1, 1925, apportionment of gasoline taxes and automobile license fees. The reason for the advance payment is simple and commendable. Road projects in various places are being held up awaiting receipt of this year's gasoline tax and automobile license money. If the payment were held up to July 1, these projects would have to wait. Since the payment is made now, they can go ahead, and the roads will be ready to use in most instances before summer comes.

This summer will bring the largest number of tourists Arkansas has ever seen. The excellent work done last spring and summer in opening through highways in this state attracted a heavy increase in tourist traffic. The fame of Arkansas roads has spread throughout the year, and there is no doubt that the season just opening will set new high records.

It is good business to send out this road money now and start it to working on the roads. It will do the state far more good on the roads than in the banks to the credit of the highway funds.

GAS TAX PROVES POPULAR

Arkansas Gazette.

The gasoline tax, which is an efficient device for making those who use the highways pay for their use, even as toll gates once required such payment, goes marching on. Thirty-five states and the District of Columbia were taxing gasoline in 1924 and a total of nearly \$80,000,000 was collected from this source. The legislatures of Kansas, Michigan and Missouri provided at their 1925 sessions for taxing gasoline and now the governor of Iowa has signed a bill, passed by the legislature of that state, which levies a two-cent gasoline tax. The Iowa executive has also approved a bill which provides for using the gasoline tax revenue in improving the highways of the state.

A dispatch from Nogales, Sonora, says the officials of that state have been notified from Mexico City that the Republic of Mexico will impose a gasoline tax to raise a fund for highways. This is a program that should mean new progress and development for Mexico.

It is estimated that during the present year there will be consumed in the United States 20,000 gallons of gasoline for every minute of every hour of the 24 and for every one of the 365 days. In 1921 our domestic consumption of gasoline was 4,474,000,000 gallons; in 1923 the home consumption was 6,493,000,000 gallons, and in 1924 it was 6,800,000,000 gallons. It is estimated that in the present year 8,950,000,000 gallons will be consumed.

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Motorists Shy at Edge of Highway

An Interesting Survey by Bureau of Public Roads.

Does the average motor car driver keep to the right of the road as far as possible or crowd over to the middle? The United States Bureau of Public Roads finds that the answer to the question is affected by the width of the road, curves, grades, slope of road surface, and conditions of the surface adjacent to the pavement. This conclusion is based on observations of the habits of drivers on highways of various kinds, widths and location. Points were selected for observation and the width of the pavement was marked off with white paint into one-foot sections so that the position of passing vehicles could be observed.

In most cases the cars were not passing other vehicles at the instant of observation. The investigation, therefore, indicates the road position preferred by the average driver. Few automobile drivers prefer a position closer to the edge of pavement than 2 1-2 feet and on meeting other cars the average driver will sacrifice clearance rather than drive closer to the edge than he instinctively feels to be safe.

Truck drivers who, as a class, are sometimes accused of being road hogs are found by the bureau to be not guilty. Most of them were observed to drive a foot closer to the edge of the pavement than drivers of motor cars and under all circumstances they adhered more closely to the side of the road.

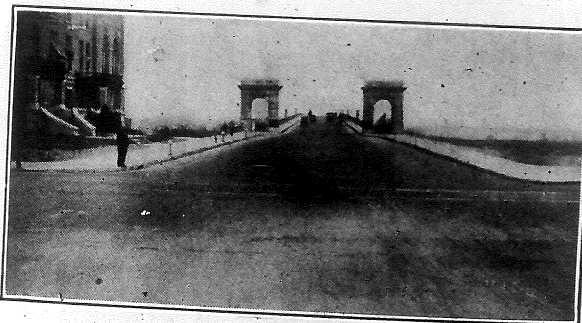
Eighteen feet is found to be the minimum width of roadway which will permit passenger vehicles and trucks driven in the preferential positions to pass in safety and

with a reasonable amount of clearance. This will allow a distance of 2.7 feet between the outer wheel and the edge of the road for automobiles and 1.8 feet for trucks with 1.9 feet clearance between vehicles.

Observations on curves showed that there is a general tendency to shift to the inside of the curve, particularly by the traffic moving on the outside. Improper banking of the road surface, poor shoulders and steep embankments on the outside of the curve all tend to make drivers crowd to the inside. White lines in the center of the road were found to be very effective in keeping traffic in its proper channel.

A report on the investigation has been issued by the bureau and it is felt that the data will be helpful to engineers in deciding on road widths and other problems of road design.

BROADWAY BRIDGE APPROACH.



Last month on our cover page we gave a picture of the Main street bridge, Little Rock, where virtually all the roads of the State highway system converge.

The burden of carrying the resulting large traffic, however, is divided by the Broadway bridge, a view of which, from the Little Rock approach, is given above.

The two million-dollar structures, built by the taxpayers of the Capital City, will be adequate for traffic needs for the next century, according to students of the question, and will stand for many centuries, engineers say, as monuments to the progressive spirit of the present generation.

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Secretary and Treasurer.

HIGHWAY DEPARTMENT GRADES WALDO AND PRESCOTT ROAD

A 10-ton tractor and a grader have been put to work grading the road from Waldo to Prescott by way of Willisville and Rosston in Nevada county. Hugh Johnson, patrolman, and a crew under his direction are clearing the right of way ahead of the grading outfit.

PLAN ROAD FROM CLARENDON TO MORO.

Representative business men from Clarendon, in conference with business men of Marianna, soon will petition the State Highway Department to include in the system of roads for Monroe and Lee counties a 28-mile stretch connecting the hard surfaced roads of these two counties. The proposed road will run between Clarendon in Monroe county and Moro in Lee county. If this road is built, there will be a direct line of good roads from Memphis through the towns of Marianna, Moro and Clarendon to points in south, southeast and southwest Arkansas. Truck lines from the gateway at Memphis probably will be routed over these roads.

The plan is to get the state highway department to lay out the proposed road from Clarendon to Moro, to maintain it and at some future time to have it hard surfaced.

CUSSING AND CUSSING.

"Some folks cusses bout de cost of good roads, but dey learnt HOW to cuss travelin' over bad roads."—*Hambone.*

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In almost every State and in Canada there are many ARMCO Culverts that have been in use from 10 to 18 years. Can other culverts claim as much?

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Best Results are Obtained from the Baths Under a Physician's Instruction

Every local citizen of Hot Springs, Arkansas, will extend every courtesy and kindness to you while here, and they join in the wish that you leave here with pleasant recollections and resolve to speak a good word for our resort to your friends at home.

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ON HOT SPRINGS MOUNTAIN.

A recent announcement from Washington is to the effect that the Department of the Interior will spend \$53,000 this year on improvement of the roads and trails in the Hot Springs National Park. With the completion of the Little Rock-Hot Springs highway this spring, and improvements on the drives of Hot Springs mountain, automobile traffic at the Spa should increase heavily this year.

Arkansas knows it has made excellent progress in a single year with the Harrelson law. Let's not trade our bread for a stone, at least, until we have had our fill of bread.—*Fort Smith Southwest Times-Record.*

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He has no brains
Beneath his hair
Who starts a trip
Without a spare.

Why was the moron driver born
Who loudly sounds his doggone horn
When calling at home? You tell;
He seems too tired to ring the bell.

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He never lets his headlights glare,
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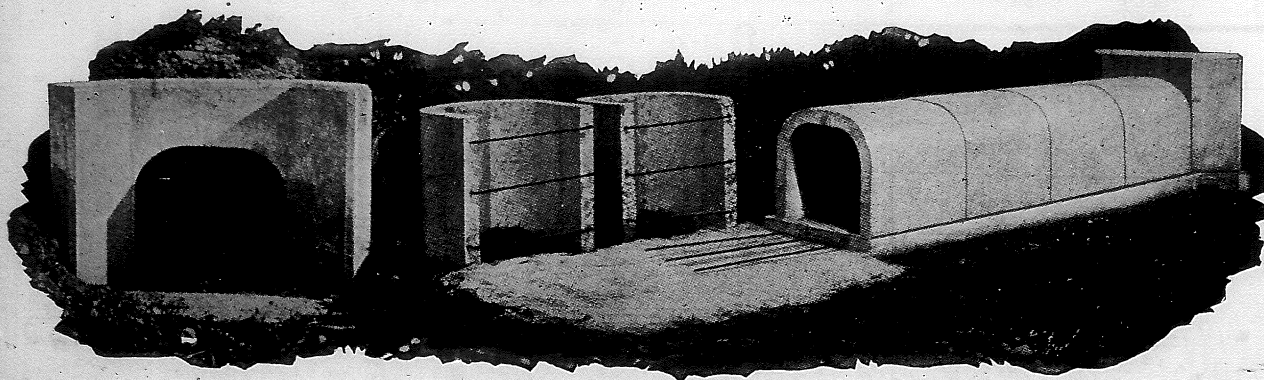
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MANY HIGHWAY MEASURES PASSED BY THE ASSEMBLY

(Concluded from Page Six.)

atory of Act No. 660 of 1921, to authorize boards in improvement districts to issue notes or bonds to meet necessary preliminary expenses.

Act No. 354—Directing the Auditor of State and State Treasurer to transfer \$20,000 from the item for "Aid in construction state highways" to the item for "Maintenance of the Highway Department," and to transfer \$100,000 from the item "Aid in construction state highways" to the item for "Maintenance, Construction and Reconstruction of state highways."

Act No. 356—To provide that where any local improvement district created by a special act has made an agreement for any construction work on original or changed plans, such district shall be empowered to carry out the agreement and issue necessary bonds for same.

Act No. 359—To facilitate the redemption from tax sales of part of tract sold for any improvement district taxes.

HIGHWAY COMMITTEE NAMED.

Under authority of the DuLaney resolution adopted by the 45th General Assembly, the text of which was published in full in the March issue of *Arkansas Highways*, Governor Terral, President Bailey and Speaker Hill have completed the naming of the committee which will make a survey of the highway finance questions of the State and recommend legislation for the relief of heavily bonded communities. The committee is composed of three senators, five representatives, citizens from each of the seven congressional districts, and two members at large. The personnel is as follows: Senator John J. DuLaney, Ashdown; Senator Brooks Norfleet, Forrest City; Senator H. A. Northcutt, Salem; Rep. Chester Holland, Fort Smith; Rep. DuVal Purkins, Warren; Rep. J. V. Walker, Fayetteville; Rep. E. E. Alexander, Blytheville; Rep. W. M. Davis, Stamps; Sebastian Straub, Helena; E. Dalton, Pocahontas; Claude Duty, Rogers; Joseph M. Hill, Fort Smith; Roy L. Thompson, Little Rock; H. C. Couch, Pine Bluff; Steve Carrigan, Hope; Clyde Pettit, Stuttgart, and J. F. Loughborough, Little Rock. The committee will begin its work at once, it is announced.

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Conclusive tests have proved that a gallon of gasoline will carry you only two-thirds as far on a gravel road as on a Concrete Road. On a dirt road a gallon will carry you only half as far as on Concrete.

With gasoline at twenty cents a gallon, you would thus pay a gasoline tax of more than 6 cents per gallon on the gravel road and 20 cents a gallon on the dirt road.

These are figures you can't get away from. You can prove them yourself.

And remember that every time you travel on either a dirt or a gravel road you also increase wear and tear on tires and run up your general repair bills.

Why continue to pay these high taxes and get nothing in return but the discomfort and inconvenience of unpaved roads and streets?

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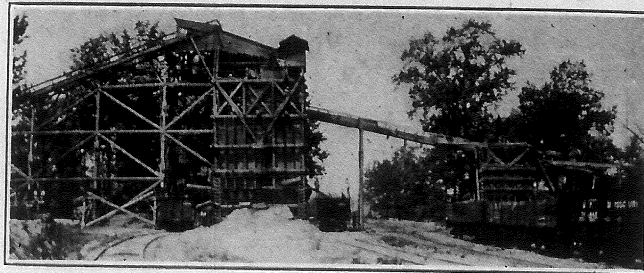
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PRESENT AND FUTURE PRACTICE IN ROAD DESIGN

(Concluded from Page Four.)

of the construction of this type of road, and in speaking of developments I refer only to those which on trial have proven worthy of being retained. From recent changes which have affected this type it would appear that we knew very little about concrete road construction a few years ago.

A comparatively recent development has been the section known as the "Bates" type, in which the edges are thicker than the center. Most of the roads built of this section have a longitudinal center joint formed by a deformed metal strip left in place. This section has come into use because of results obtained in the Bates Experimental Road tests. Without going too deeply into the theory of the design, it might be said that the thicker edge is useful because of the warping action which draws the edges of the pavement away from the subgrade, leaving the edges unsupported and liable to break under heavy trucks.

Illinois and other states have adopted this type as their standard section, and Arkansas is now building this type. It is probable that until some radically different type is developed by experiment, this Bates type road will be about the only type of concrete road constructed.

The time during which concrete pavements have been constructed has seen a constant refinement in construction methods. There is a growing tendency to proportion aggregates according to their grading instead of by arbitrary proportions. The amount of water used in mixing is carefully regulated, and some states are now measuring aggregates by weight instead of by volume. More care is being used in tamping and finishing, and most specifications now require machine tamping.

We have yet to consider the desirable crown for the different types. It is necessary, of course, to provide sufficient crown to shed the water, and this is all that should be given to pavements, or about one-quarter inch or less per foot. This state has been gradually flattening the crown of the standard pavement sections in line with standard practice in other states. As an example, some concrete road has been constructed in this state with a crown of two and three-quarter inches for a fourteen-foot width, while the Little Rock-Hot Springs road, now under construction, has a crown of one and one-half inches for an eighteen-foot width.

A gravel road with a flat crown rides easier than one with a higher crown, and is more easily maintained in good condition for the reason that traffic on a road with a high crown stays in the center of the road as much as possible and thus concentrates the wear. Where a gravel road does not have systematic maintenance, however, the road with a flat crown soon becomes dished in many places, and allows water to stand in the road. Before the state took over the maintenance of the state highways, gravel roads were being built with a crown slope of three-quarters of an inch or greater per foot. Our gravel roads are now being built with a crown slope of from three-eighths inch to one-half inch per foot.

Curves are now super-elevated and widened, our practice being to widen any curve with a radius of less than six hundred feet, and to super-elevate any curve with a radius of less than one thousand feet. The added width on curves

of two hundred foot radius is six feet, and the super-elevation on curves of this radius is from three-quarters of an inch to one inch per foot of width.

While discussing the matter of curves, it might be interesting to note that only in exceptional cases will the Bureau of Public Roads approve curves of less than five hundred foot radius. Until recently we have been able to secure approval of curves of two hundred foot radius, but the minimum now sought by the Bureau is five hundred feet.

Examples and comparisons of past, present and future practice in road design and construction could be mentioned in number sufficient to take a great deal more space than is allotted to me. I have mentioned enough, however, to show that our design practice is constantly improving and the end is not yet.

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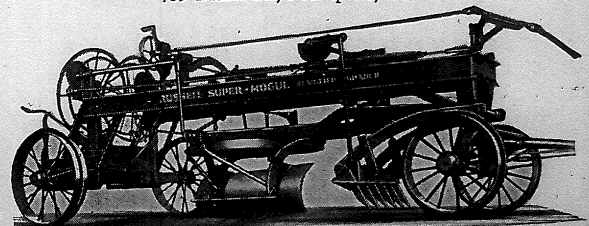
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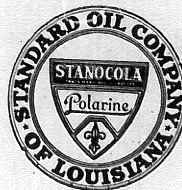
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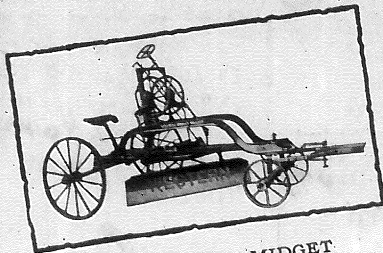
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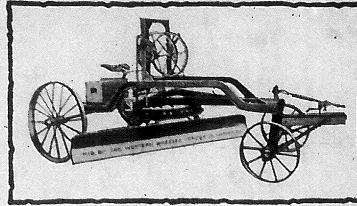
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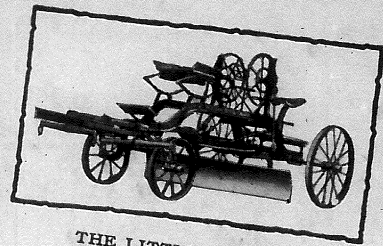
4-0433, 4-0434



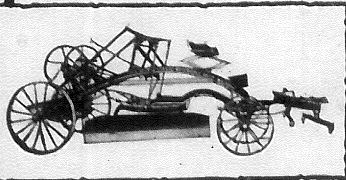
THE WESTERN MIDGET GRADER
 Weight: 1000 pounds
 Blade Length: 5 or 6 feet



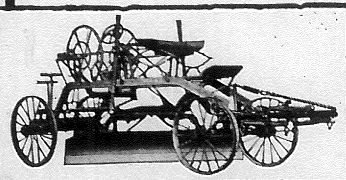
WESTERN PATROL GRADERS
 Weight of No. 1—1400 pounds
 Blade Length: 8 feet
 Weight of No. 2: 1000 pounds
 Blade Length: 8 feet



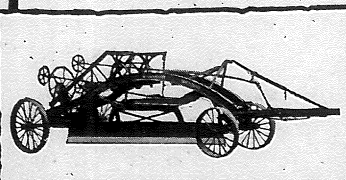
THE LITTLE WESTERN GRADER
 Weight: 1450 pounds
 Blade Length: 6 feet



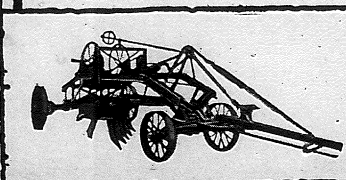
THE AUSTIN STANDARD GRADER
 Weight: 2500 pounds
 Blade Length: 7 feet



THE AURORA STANDARD AND SPECIAL GRADERS
 Weight of Standard: 2925 pounds.
 Blade Length: 8 feet
 Weight of Special: 3300 pounds.
 Blade Length: 7 or 8 feet



THE AUSTIN MAMMOTH JUNIOR AND SENIOR GRADERS
 Weight of Junior: 6750 pounds.
 Blade Length: 10 feet
 Weight of Senior: 7600 pounds.
 Blade Length: 12 feet



THE WESTERN No. 14 SCARIFIER
 Weight: 11,500 pounds

A-W GRADERS

Below are mentioned, the four things that are the best possible advance guarantee of satisfactory service from any piece of road machinery. Let us see how A-W Graders meet the test.

SCIENTIFIC DESIGN?

The first Austin and Western graders were made over 40 years ago. In design and construction they are not only scientific, but above all things thoroughly practical, because they embody all the worth-while features that these years of experience have developed, and no untried theories that have not stood the test of time.

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The second Western grader, made and sold in 1879, is still in active-service.

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Thousands of Austin and Western graders of all sizes are in daily use in practically every country in the world.

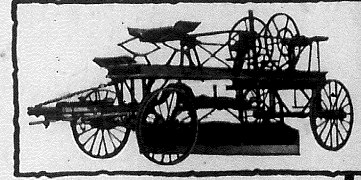
A COMPLETE LINE?

A-W graders range in weight from 1,000 to 11,500 pounds; and in blade length, from 5 feet to 12 feet.

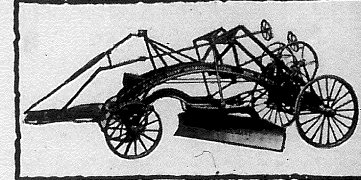
Whether your work be the construction of a new road through the roughest kind of country; the efficient, economical maintenance of an earth or gravel road; or "just grading"; you will find on this page a model as good as made-to-order for you. General Catalog No. 24 tells all about these graders—Write for a copy.

The Austin-Western Road Machinery Co.

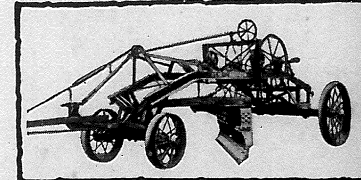
CHICAGO :: ILLINOIS



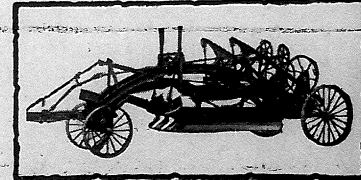
THE WESTERN STANDARD AND SPECIAL GRADERS
 Weight of Standard: 2675 pounds.
 Blade Length: 7 feet
 Weight of Special: 2900 pounds.
 Blade Length: 7 feet



THE AUSTIN GIANT GRADER
 Weight: 4150 pounds
 Blade Length: 8 feet



THE WESTERN No. 20 GRADER
 Weight: 11,500 pounds
 Blade Length: 12 feet



THE AUSTIN JUNIOR AND SENIOR RIP-SNORTERS
 Weight of Junior: 5000 pounds.
 Blade Length: 8 feet
 Weight of Senior: 9300 pounds.
 Blade Length: 9 feet

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