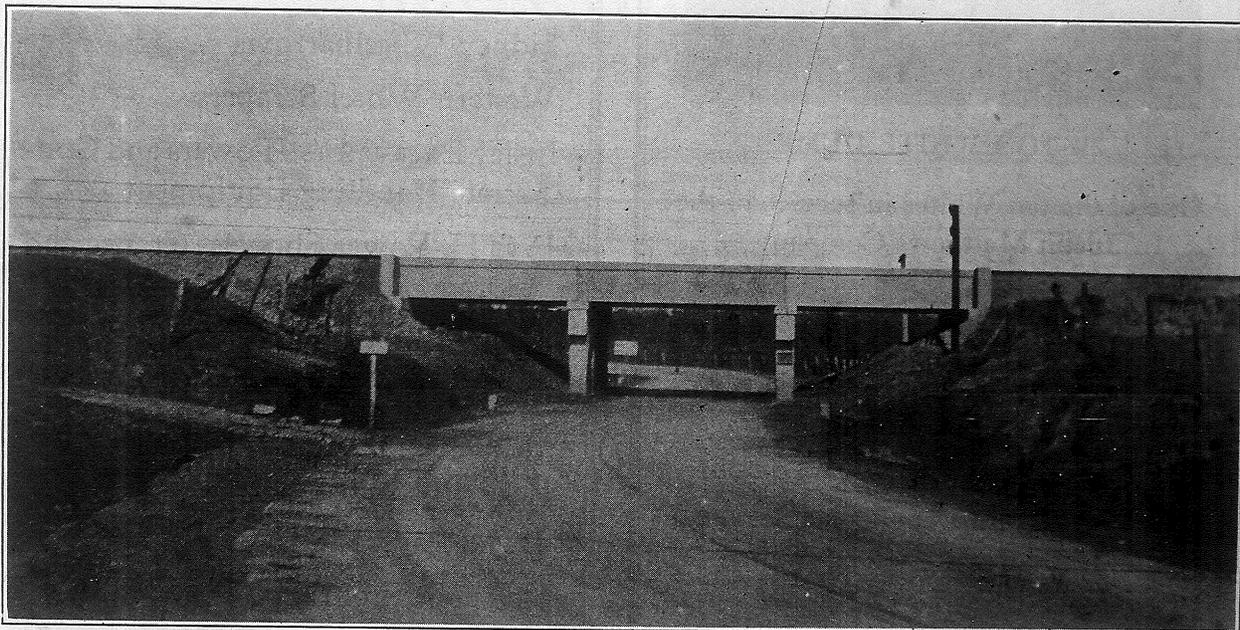


ARKANSAS HIGHWAYS

The Official Magazine of the Arkansas
State Highway Department, Little Rock



A GRADE SEPARATION--ARKANSAS-MISSOURI HIGHWAY No. 67

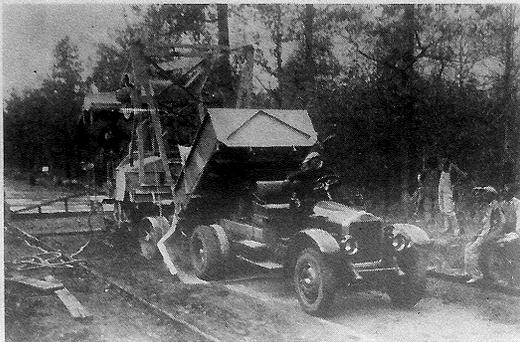
Vol. 4

DEC. • 1927

No. 12

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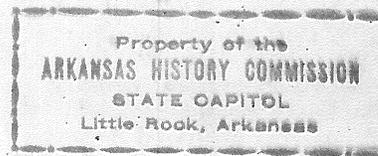
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ARKANSAS HIGHWAYS

*Official Monthly
Magazine*



*State Highway
Department*

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VOL. IV.

DECEMBER, 1927

No. 12

THE FIRST LAP

By DWIGHT H. BLACKWOOD, State Highway Commissioner

The first milestone of my administration as Highway Commissioner will be ended with the passing of 1927. Making successfully, as I have this first lap of a new undertaking, and pausing for a moment in retrospection of the achievements of that brief period, I am mindful of a deep debt of gratitude I owe to each and every one of my friends.

To those who stood by me in the race for the office I am thankful. To those who have labored so loyally by my side in the effort to give the State a full measure of earnest endeavor and to accomplish the greatest possible results, I am also thankful. To the people who had other ideas about who their Highway Commissioner would be I am thankful too, for you have been splendid in your attitude and on the part of a great number, helpful in your co-operation — coming after you saw the earnestness of all those in the Highway Department.

With your help and with your patience, and although coming late — with the money with which to do things, we are told by people from all sections of the State that we have done well. Therefore we are happy.

I pledge you a continuation of our best efforts. I promise you a business-like administration will be continued in the office and in the offices of the various district engineers. I assure you that additional roads and bridges will be built as rapidly as possible, and when, in closing, I ask for a continuation of your friendship and help, I hope to always merit it. It is the earnest hope of all those connected with the Highway Department that you, each of you will realize your every worthy desire in 1928.

Southwestern Highway Club Formed

Interesting Meeting in Fort Worth, Texas, Well Attended. Roy M. Johnson of Oklahoma Elected President; Blackwood, Vice-President.

On his return from the Southwestern Highway Conference, held in Fort Worth November 28th and 29th, V. A. Kleiber, who represented the Arkansas Highway Department, reports a very interesting meeting, and many progressive ideas advanced, as well as the formation of plans for some definite good in the direction of correcting present highway problems.

The meeting was held under the auspices of the Highway Club of Texas and the Oklahoma Good Roads Association for the purpose of discussing problems that are common to the various Highway Departments and in which the National Government is also vitally interested. Sensing the need for modernization and uniformity of highway laws and traffic regulations in the Southwest, the two outstanding highway organizations of Texas and Oklahoma took the initiative in calling the conference, which meeting was similar in nature to many others that have been held in various parts of the nation. Five States in the Southwest whose highway and traffic problems are nearly identical participated in the conference, Texas, Oklahoma, New Mexico, Arkansas and Louisiana. A resolution adopted at the closing session called for the formation of the Southwestern Highway Club with a membership comprising highway leaders in the States composing the Southwest group.

Resolutions also indorsed the Hoover uniform highway code, which was set forth in detail by Col. A. B. Barber of the United States Chamber of Commerce.

Roy M. Johnson, a former member of the Oklahoma Highway Commission, was elected president of the new club, and Judge August McCloskey of Texas, Dwight H. Blackwood of Arkansas, were selected as vice-presidents. The vice-presidents from New Mexico and Louisiana will be named later.

The directors chosen are: Oklahoma, Roy M. Johnson, Cy Avery and Frank Fuqua; from Arkansas, Dwight Blackwood, J. S. Parks and A. Kleiber, and from Texas, Judge McClosky, Arthur L. Goetz and William T. Wheeler, who also was elected the managing director.

Adoption of the resolution followed a session in which D. C. Fenner, New York, representing the National Automobile Chamber of Commerce; Judge McCloskey of San Antonio; Cyrus S. Avery, Tulsa, Okla., ex-chairman of the Oklahoma Highway Commission, and Cone Johnson, member of the Highway Commission of Texas, made addresses. The conference closed with the meeting of the safety council.

FILLING OF GAPS URGED

Imperative need of a connected system of highways and the filling in of the gaps before any highway construction that is not urgent is begun was stressed by Commission Johnson in an address in which he recounted the large mileage of the Texas highway system.

"With an income which we have at the present time," he said, "it would require more than 30 years to build a passable hard surface system of highways.

"There is not a highway in Texas. There are lots of roads.

COAST HIGHWAY DISCUSSED

"The fact was developed at the last meeting of the board, at which the report of the auditor was received, that all the federal aid, not only that which is available at the present time but the anticipated allotment, has been allotted, and most of it has gone to 50 of the 250 counties in the State.

"Now the great central part of the State, where more than one-half the people of the State reside, more than one-half of the taxable values exist and more than one-half of the automobile registrations are, has received practically no State money when compared with that distributed in the other portions of the State."

"The highway map of Texas must be radically cut down. There should be the elimination of from 3,000 to 5,000 miles of highway which is nothing more at the present time than country roads.

STATE BONDS ADVOCATED

"Before we can make an extended highway program we will have to have an amendment to the Constitution so that the commission can issue its debentures, supported by the gasoline tax. Probably the only solution of the problem at the present time is the passage of a State bond law, whereby the State may issue bonds. If the poorest counties in the State can burden themselves down with a bond issue that will require 40 years to pay, why can not the great State of Texas, without a penny of indebtedness, vote a bond issue which will be retired with the gasoline tax. If the present multiple system of taxes goes on, county, district and the other tax schemes, every county in Texas will be bankrupt within the next generation."

Fenner, in his address, stressed the importance of the truck industry and discussed weight taxation. Avery told of the value of proper marking of highways. Judge McCloskey doubted the constitutionality of many of the statutes which would be necessary for the enactment of the Hoover code. He declared Texas' greatest need is for a new Constitution which would be up to date.

GILMORE URGES SAFETY

Apathy of the public to the work of the Safety Councils which are making a drive against automobile and grade crossing accidents was deplored by Clarence Gilmore, chairman of the Texas Railroad Commission, who presided at the Safety Council conference.

"In An Awful Fix"

A religious old negro carpenter attended his church prayer-meeting one night, and near the close arose and asked permission to speak. His talk was brief, but earnest and meaningful:

"Dear bredden and sistern," said he, "I arises to ax yo' all to rassel wid me in pra'r. I is in a close place an' needs de hep of de Lo'd. I is got a contrac' to build a fence betwist Kunnel Smif's water-mellon patch an' Mis' Green's chicken coop, an' I craves yo' prevailin' pra'rs."

—Wichita Price Current.

Contracts Awarded At December Meeting Total More Than Two Million Dollars

Thirty-Six Construction Contracts Given

The State Highway Commission at December 15th meeting awarded thirty-six road and bridge construction contracts, involving expenditure of \$2,293,903.96 from the State highway fund. The projects include approximately 250 miles of road.

The commission reached a tentative agreement with engineers representing the Federal Bureau of Roads to double the width of an 850-foot trestle section of the Harahan viaduct, if satisfactory arrangements can be made with the contractors.

The section nearest the Mississippi River would be increased from 20 to 40 feet in width to more nearly correspond with the earth dump sections, which will be increased to 56 feet in width at the top. Funds for the extra width will come from tolls on the old viaduct. A. R. Losh, federal district engineer, appeared before the State Highway Commission yesterday and discussed the question of widening the concrete bridge sections. The change was proposed by Mr. Losh several weeks ago and preliminary negotiations were started.

Engineers for the Fuller Construction Company, contractor for the concrete trestle work, have indicated that the bridges can be widened at a slightly smaller unit cost than the contract calls for on the original project. Highway Engineer C. S. Christian will confer with engineers for the contractors next week. The proposal to widen the bridges does not extend at present to the 3,000-foot section, although it has been intimated that this section may be included later, making the entire concrete portion 40 feet wide.

AGREEMENT WITH POWER COMPANY

An agreement was made with the Arkansas Power and Light Company, whereby that company will bear the increased cost of high level bridges over the Ouachita River on State Highways Nos. 7 and 70, south and southwest of Hot Springs. Construction of a proposed dam by the power company would raise the water level to such an extent that bridges at the level proposed by the Highway Commission would be overflowed. The company has agreed tentatively to bear the additional expense of raising the bridges up to \$225,000.

All bids on four road projects were rejected and bids on one were withdrawn. Tentative awards were made in several instances, pending completion of negotiations for a right-of-way or approval by the Federal Bureau of Roads.

Some of the projects on which bids were rejected will be readvertised for the next meeting of the commission, at which time bids will be received on the Fulton toll bridge between Miller and Hempstead counties, Commissioner Dwight H. Blackwood said. No new road projects will be advertised before February, the commission deeming it desirable that time be given to check up on all the projects now under construction and to permit the engineering department to complete surveys and plans on various proposed projects.

CONTRACTS AWARDED

Contracts awarded yesterday follow:

Job No. 117, Lee County—All bids rejected.

Job No. 133, State Highway No. 501, Lee County—Approximately 843 lineal feet of treated timber pile bridges on the Marianna-Southeast road, to J. F. Mullin, Pine Bluff, \$24,090.18.

Job No. 215, State Highway No. 13, Ashley County—Approximately 11½ miles of grading and drainage structures and gravel surfacing on the Hamburg-North road, Johnson Team and Dray Company, Little Rock. \$100,044.36.

Job No. 216, State Highway No. 13, Drew County—Approximately 16 miles of grading and drainage structures and gravel surface on the Monticello-South road. J. P. McNulty, Pine Bluff, \$157,446.28.

Job No. 220, State Highway No. 220, Drew County—Approximately 13 miles of grading and drainage structures and gravel surfacing on the Monticello-West road. J. P. McNulty, Pine Bluff, \$91,522.42.

Job No. 318, State Highway No. 26, Pike County—Approximately 140 lineal feet of reinforced concrete bridge over Saline Creek on Delight-Murfreesboro road. W. P. McGeorge & Co., Pine Bluff, \$13,119.64.

Job No. 326, State Highway No. 4, Hempstead County—Approximately six miles of grading and drainage structures on the Ozan-Washington road. J. M. Howell, DeQueen, \$22,793.80.

Job No. 328, State Highway No. 71, Miller County—Approximately ten miles of grading and drainage structures on Texarkana-Sulphur River road. J. R. Miller, Texarkana, \$55,639.67.

Job No. 352, State Highway No. 71, Miller County—Approximately 10½ miles of grading and drainage structures on Texarkana-Sulphur River road. McGuire & Cavender, Texarkana, \$52,872.63.

Job No. 353, State Highway No. 51, Clark County—Approximately four miles of grading and drainage structures on the Arkadelphia-Donaldson road. Browne & Ross, Arkadelphia, \$47,540.13.

Job No. 411, State Highway No. 27, Montgomery County—Approximately nine miles of grading and drainage structures on the Norman-Mt. Ida road. Barker Bros., Amarillo, Tex., \$73,212.86.

Job No. 412, State Highway No. 45, Washington County—Approximately 10½ miles of grading and drainage structures on the Fayetteville-Prairie Grove road. Cole Bros. & Denniston, Alma, \$44,090.25.

Job No. 429, State Highway No. 64, Crawford and Franklin counties—All bids rejected.

Job No. 430, State Highway No. 99, Benton County—Approximately 582 lineal feet of treated timber bridge and redecking adjacent steel span on the Goforth bridge over Illinois River between Siloam Springs and Cincinnati. C. M. Greene, Rogers, \$13,885.18.

Job No. 433, State Highway No. 71, Scott County—Approximately 10½ miles of grading and drainage structures on the Mansfield-Waldron road. Altman-Rodgers Co., McAlester, Okla., \$72,840.46.

Job No. 520, State Highway No. 11, Sharp County—Approximately 11½ miles of grading and drainage structures on the Evening Shade-Ash Flat road. Davis Construction Co., Booneville, Mo., \$60,447.49.

Job No. 538, State Highway No. 60, White County—Approximately 12 miles of crushed stone surfacing on the Beebe-El Paso road. Malvern Construction Co., Malvern, \$86,448.60.

Job No. 625, State Highway No. 11, Prairie County—Approximately 17½ miles of grading and drainage structures and gravel surfacing on the Hazen-Des Arc road. Johnson Team and Dray Co., Little Rock, \$119,844.59.

Job No. 627, State Highway No. 7, Hot Spring County—Approximately 12 miles of grading and drainage structures and gravel surfacing on the Bismarck-North and South road. George W. Nickels & Son., Hot Springs, \$96,363.06.

Job No. 630, State Highway No. 31, Lonoke County—Approximately 17 miles of grading and drainage structures and gravel surfacing on the Lonoke-Beebe road. Ellis & Lewis, Muskogee, Okla., \$114,240.53.

Job No. 632, State Highway No. 70, Hot Spring and Garland counties—Approximately 489 lineal feet of reinforced steel concrete bridges on the Hot Springs-Glenwood road. Cook & Ransom, Ottawa, Kansas, \$35,599.96.

Job No. 710, State Highway No. 24, Ouachita County—Approximately five and a half miles of grading and drainage structures and gravel surfacing on the Chidester-Nevada County line road. S. B. Boyd, Columbia, Miss., \$49,605.13.

Job No. 711, State Highway No. 24, Ouachita County—Approximately one and one-half miles of gravel surfacing on the Camden-Chidester road. J. C. Elliott & Co., Leola, \$1,655.55.

Job No. 721, State Highway No. 167, Dallas and Cleveland counties—Approximately ten miles of grading and drainage structures on the Fordyce-North road. J. P. McNulty, Pine Bluff, \$73,936.92.

Job No. 726, State Highway No. 19, Columbia County—Approximately 17½ miles of grading and drainage structures and gravel surfacing on the Magnolia-South road. Tarrant & Miles, El Dorado, \$118,288.84.

Job No. 730, State Highway No. 15, Cleveland County—Approximately seven miles of grading and drainage structures and gravel surfacing on the Pansy-South road. J. A. Perdue & Co., Pine Bluff, \$39,412.49.

Job No. 734, State Highway No. 19, Columbia County—Approximately six and one half miles of grading and drainage structures and gravel surfacing on the Waldo-Nevada County line road. Tarrant & Miles, El Dorado, \$40,782.69.

Job No. 741, State Highway No. 2, Ouachita and Columbia counties—Approximately five and one-half miles of grading and drainage structures and gravel surfacing on the Stephens-Magnolia road. Hill Contracting Co., Little Rock, \$57,703.06.

Job No. 749, State Highway No. 9, Dallas County—Approximately nine miles of grading and drainage structures and gravel surfacing on the Princeton-Holly Springs road. J. A. Perdue & Co., Pine Bluff, \$76,110.47.

Job No. 752, State Highway No. 167, Ouachita County—Approximately eight and one-half miles of grading and drainage structures on the Smackover-Camden road. L. T. Campbell, El Dorado, \$80,240.70.

Job No. 809, State Highway No. 105, Pope County—Approximately nine miles of grading and drainage structures on the Atkins-Hector road. Lakeside Bridge and Steel Co., Dardanelle, \$66,952.93.

Job No. 813, State Highway No. 65, Van Buren County—All bids rejected.

Job No. 820, State Highway No. 116, Logan County—Approximately two and one-half miles of grading and drainage structures on the Booneville-State Sanatorium road. Blythe & Isom, Booneville, \$25,610.89.

Job No. 916, State Highway No. 65, Boone County—Approximately 388 lineal feet of reinforced concrete bridges and one box culverts on the Harrison-Omaha road. Blackshire & Blackshire, Harrison, \$36,906.51.

Job No. 917, State Highway No. 14, Marion County—Approximately five miles of grading and drainage structures on Yellville-Lead Hill road. North Arkansas Construction Co., Yellville, \$39,883.38.

Job No. 1028, State Highway No. 63, Lawrence County—Approximately 11 miles of grading and drainage structures and gravel surfacing on the Imboden-



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Powhatan-Black Rock road. Davis Construction Co., Booneville, Mo., \$120,433.87.

Job No. 1031, State Highway No. 18, Craighead and Poinsett counties—Approximately nine miles of grading and drainage structures and gravel surfacing on the Cash-Pitts road. J. M. Howell, DeQueen, \$64,162.57.

Job No. 1033, State Highway No. 1, Craighead County—Approximately seven miles of grading and drainage structures and gravel surfacing on the Greene County line-Jonesboro road. Bunnell & Mack, Paragould, \$62,080.50.

Job No. 1034, State Highway No. 1, Clay County—All bids rejected.

Job No. 1075, State Highway No. 63, Poinsett County—Approximately 92 lineal feet on reinforced concrete bridge on Marked Tree-Tyronza road. V. W. Clanton, Tyronza, \$16,435.75.

Job No. 1105, State Highway No. 3, Prairie and Monroe counties—Approximately seven miles of grading and drainage structures and gravel surfacing on the Ulm-Roe road. W. P. McGeorge & Co., Pine Bluff, \$56,719.78.

Roads and National Unity

What will the automobile traffic in this country amount to in twenty years, when Chicago, the central city of the United States, will have a population of from six to ten million people?

The managing director of the American Road Builders' Association recently estimated 50,000,000 cars in service by 1946. Automobile registration is going ahead at a rate that will double the number of cars registered in eight years. Therefore the estimate seems, to say the least, reasonable.

The automobile may become the greatest factor for economic unity, and even national unity, this country has known. Reducing distances, it annihilates boundaries. But it will only fulfill its possibilities as a unifying force as we give it trans-continental roads to run on.

A system of wide concrete highways both east and west and north and south, that will really take care of the traffic as it grows, has been worked out in detail, and the money is easily available in the country to build them. By 1936, according to the plans to be set forth by the Roadbuilders' Association, such a system can be completed.

The essential nature of such a system has been set forth many times. The farmer needs trans-continental roads to develop his market by cheaper transportation; the consumers of cities and towns need them to provide more cheaply their requirements; the government needs them for military service in case of war, for if another war comes the whole country must fight it, not a few soldiers.

And the people above all need these roads, for the development of that national unity which can only arise when one section knows all sections, when the folk of one part of the country are accustomed to traveling freely to and in all other parts. Such a system of trans-continental roads is not a dream. Without it, the country is half strangled.—*Chicago Record Herald and Examiner.*

SOME OLD AND NEW FREAK PATENTS

Automatic hat tippers that make it unnecessary for you to raise your hand when you want to doff your chapeau to a lady as you pass her.

Machines for transplanting hair, one piece at a time. An automatic cash register by which another egg is rung up every time the hen proudly cackles cut-cut-cut-ca-docket.

A rat food composed largely of cork, which gives the rodent an awful thirst, and then when he drinks water the cork swells up and kills him.

A centrifugal propeller in a golf club that makes the duffer's drive look like that of a "pro."

Those are some of the freak patents that have been taken out in the United States Patent Office. "Nut" inventions by the thousands can be dug from the records of the patent office here. Even Abraham Lincoln contributed when he was President. He took out a patent intended to lift boats over sandbars in the river, because he had found the need of such a device when he made his famous trip down the Mississippi. The device was never practical.

The first patent was taken out in 1641, and in 1833 a man resigned from the patent office because he thought that everything possible had been invented. He wanted to obtain employment somewhere else before the rush of unemployment started from the dead patent office. At that time there had been 576 patents issued. Now they are being issued at the rate of 800 a day.

The automatic hat tipper for the ultra-polite man consists of a patented mechanism inside the hat. As the wearer inclines his head forward in bowing, the hat is lifted from the head momentarily and then drops back in place.

The patented hair transplanter consists of a tubular needle in which is placed one hair at a time, with a knot tied at the end. After the needle is pushed through the scalp, it is withdrawn. The imbedded knot prevents the hair from falling. "Who's next?"

Data on Hen's Output

The automatic cash register, attached to the hen, is intended to print on the egg the date laid.

The sound sleeper has a means of waking himself. A patented alarm clock not only summons you noisily but drops a ball on the head of the sleeper to make him get up.

A Brooklyn man has patented the device to give distance to the golf ball. The centrifugal propeller may be applied to the baseball bat, hammer, and other similar equipment, just as it is utilized in the golf club. Many years ago he heard of an ancient sword, reputed to have magical qualities. It was later discovered that its virtue lay in a hollow tube, running the length of the blade, and forming a channel for a globule of mercury. When the sword was raised, the mercury reposed in its hilt, but when it was swung into action the mercury rushed toward the tip, adding weight to the force of the blow.

Cholly (to shopman): "I say-aw-could you take that yellow tie with the pink spots out of the show-window for me?"

Shopman: "Certainly, sir. Pleased to take anything out of the window any time, sir."

Cholly: "Thanks awfully. The beastly thing bothaws me every time I pass. Good mawning."

—*Hardware Age.*

Record of Road and Bridge Contracts Awarded from Jan. 1 to Dec. 1, 1927

NAME AND ADDRESS OF CONTRACTOR	STATE JOB No.	ROAD and SECTION NUMBER	COUNTY	Length in Miles or Ft.	NATURE OF WORK	Total of Contract Award Plus Material Furnished by State
Vincennes Bridge Company, Vincennes, Indiana.....	100	3-S-16	Lee	1,800 Ft.	Steel bridge and substructure.	\$239,348.80
Hall and Williams, Des Arc, Arkansas.....	600	38-S-2	Prairie	1,800 Ft.	Timber bridges and approaches.	16,357.60
Geo. W. Nickels & Son, Box 471, Hot Springs, Ark.....	601	11-S-10	Garland	1.417 Mi.	Grading, drainage structures, concrete pavement.	47,722.85
Kow Paving Co., Topeka, Kansas.....	400	6-S-5	Sebastian	0.640 Mi.	Topeka mix pavement.	17,088.74
F. D. Harvey & Co., 688 S. Bellevue, Memphis, Tenn.....	101	22-S-1	Phillips	6.058 Mi.	Grading, drainage structures.	17,687.50
Tarrant & Miles, El Dorado, Ark.....	300	1-S-8	Lafayette	9.594 Mi.	Grading, drainage structures, gravel surfacing.	45,250.21
Miss.-Ark. Construction Company, 3618 W. Markham, Little Rock, Ark.....	702	29-S-2	Calhoun	14.788 Mi.	Gravel surfacing.	27,669.25
Lawrence Construction Company, Jackson, Miss.....	703	4-S-10	Bradley	6.306 Mi.	Concrete paving.	146,430.16
Lynch & Hill, Little Rock, Ark.....	705	15-S-4	Calhoun	16.828 Mi.	Grading, drainage structures.	48,964.69
Kochitzky & Prosser, Carbondale, Ill.....	700	115-S-3	Union	10.814 Mi.	Grading, drainage structures, concrete paving.	321,811.15
Miss.-Ark. Construction Company, 3618 W. Markham, Little Rock, Ark.....	704	167-S-2	Columbia	3.163 Mi.	Grading, drainage structures.	18,811.59
McGuire & Cavender, Texarkana, Texas.....	701	2-S-4	Union	3.55 Ft.	Reinforced concrete girder, bridges.	40,870.88
Selz Construction Co., McGehee, Ark.....	200	167-S-2	Chicot	7.810 Mi.	Gravel surfacing.	54,428.30
J. G. Newkirk, Chaudrant, La.....	301	59-S-1	Miller	7.950 Mi.	Grading, drainage structures.	42,776.22
McGuire & Cavender, Texarkana, Texas.....	302	71-S-1	Miller	200 Ft.	Two reinforced concrete girder bridges.	16,286.35
J. W. Covington, Benton, Ark.....	706	71-S-1	Calhoun	98 Ft.	Treated timber bridge.	3,088.59
J. F. Mullins, Pine Bluff, Ark.....	201	4-S-10	Desha	400 Ft.	Two treated timber bridges.	12,211.00
Merchants Transfer Company, Little Rock, Ark.....	1000	4-S-16	Greene	7.765 Mi.	Gravel surfacing and grading, drainage structures.	79,998.24
James & Hopper, Alma, Ark.....	401	25-S-8	Crawford	4.737 Mi.	Grading, drainage structures.	27,057.41
Ellis & Lewis, Muskogee, Oklahoma.....	500	71-S-15	Independence	10.953 Mi.	Gravel surfacing.	40,065.90
R. J. Lynch, Little Rock, Ark.....	716	25-S-8	Bradley	13.503 Mi.	Grading, drainage structures.	32,885.71
Lynch & Hill, Little Rock, Ark.....	707	15-S-3	Calhoun	364 Ft.	Steel and concrete bridges.	42,277.03
Bunnell & Mock, Paragould, Ark.....	1016	115-S-3	Clay	1.470 Mi.	Grading, drainage structures.	19,344.23
S. C. Taylor, Birmingham, Ala.....	1017	1-S-21	Clay	9.563 Mi.	Grading, drainage structures.	35,824.06
B. H. Heard, Little Rock, Ark.....	501	34-S-5	Cleburne	8.899 Mi.	Grading, drainage structures.	52,852.66
Peters & DeCamp, Little Rock, Ark.....	802	16-S-11	Conway	93 Ft.	Steel and concrete bridges.	7,454.28
C. B. Gregg, Jonesboro, Ark.....	1015	9-S-8	Craighead	3.038 Mi.	Grading, drainage structures, gravel surfacing.	23,895.90
James & Hopper, Alma, Ark.....	402	18-S-4	Crawford	8.967 Mi.	Burnt shale surfacing.	18,856.27
W. J. Runyan Paving Co., Sheffield, Ala.....	120	64-S-2	Cross	15.181 Mi.	Gravel surfacing.	37,621.37
Fuller Construction Co., Dallas, Texas.....	102	1-S-14	Crittenden	4,200 Ft.	Concrete structures	450,339.34
J. M. Howell, DeQueen, Ark.....	515	70-S-20	Jackson	1,180 Ft.	Untreated timber bridges.	13,759.81
J. G. Newkirk, Doddridge, Ark.....	331	18-S-1	Lafayette	11,000 Mi.	Gravel surfacing	45,216.00
Luten Bridge Co., Little Rock, Ark.....	1101	29-S-1	Logan-Scott	274 Ft.	Concrete bridges	23,807.64
Ellis & Lewis, Muskogee, Oklahoma.....	803	71-S-12	Logan	9.671 Mi.	Grading, drainage structures.	54,772.42
Richardson Ayres, Hope, Ark.....	332	22-S-3	Little River	7.469 Mi.	Gravel surfacing.	21,687.00
S. C. Taylor, Birmingham, Ala.....	900	71-S-8	Marion	8.504 Mi.	Grading, drainage structures.	73,955.76
J. D. & R. P. Sims, Hughes, Ark.....	103	14-S-3	Monroe	10.236 Mi.	Gravel surfacing.	33,888.46
J. G. Newkirk, Doddridge, Ark.....	315	17-S-1	Nevada	7.575 Mi.	Grading, drainage structures.	35,298.66
J. P. McNulty, Pine Bluff, Ark.....	718	19-S-3	Ouachita	1,449 Mi.	Grading, drainage structures.	9,516.92
J. P. McNulty, Pine Bluff, Ark.....	333	24-S-6	Pike	7.600 Mi.	Gravel surfacing.	21,104.60
Williamson & Williams, Batesville, Ark.....	1001	26-S-6	Poinsett	2,000 Ft.	Steel and Concrete bridges, grading.	111,645.41
Harvey Brown Construction Co., Little Rock, Ark.....	615	63-S-7	Saline	20,000 Mi.	Grading and structures. Flood damage.	33,839.08
W. D. McCoy & Son, Fort Smith, Ark.....	404	70-S-10	Sebastian	15,309 Mi.	Grading, drainage structures.	78,110.80
O'Hagan & McVicker Co., Kansas City, Mo.....	405	71-S-14	Sebastian	227 Ft.	Concrete bridges.	31,696.05
Interstate Construction Co., Paris, Texas.....	415	22-S-1	Sebastian	9.954 Mi.	Grading, drainage structures.	40,910.31
O'Hagan & McVickers Co., Kansas City, Mo.....	403	71-S-11	Scott	2,260 Ft.	Concrete bridges and grading.	32,948.26
M. D. L. Cook, Little Rock, Ark.....	715	2-S-5	Union	18,255 Mi.	Concrete surfacing.	457,031.59
A. A. Davis & Co., Kansas City, Mo.....	502	14-S-12	Jackson	8.804 Mi.	Grading, drainage structures and gravel surfacing.	81,991.54
L. T. Campbell, El Dorado, Ark.....	717	4-S-13	Bradley	5.680 Mi.	Grading, drainage structures.	51,823.75
M. E. Gillioz, Monette, Mo.....	804	22-S-5	Yell	8.249 Mi.	Grading, drainage structures.	68,238.34
Thurber Construction Company, Fort Worth, Texas.....	901	14-S-3	Marion	6.856 Mi.	Grading, drainage structures.	58,452.50
M. E. Gillioz, Monette, Mo.....	915	65-S-1	Boone	7.890 Mi.	Grading, drainage structures.	98,031.30
Cook & Ransom, Ottawa, Kansas.....	1103	71-S-12	Logan-Scott	7.645 Mi.	Grading, drainage structures.	38,108.82
Johnson Team & Dray Co., Little Rock, Ark.....	221	35-S-8	Drew	4.662 Mi.	Gravel surfacing.	26,832.65
C. H. Atkinson Paving Co., Chillicothe, Mo.....	224	4-S-15	Drew	154.4 Ft.	Treated timber trestle.	4,735.80
J. P. McNulty, Pine Bluff, Ark.....	227	31-S-1	Jefferson	6.312 Mi.	Gravel surfacing.	31,719.83
Cook & Ransom, Ottawa, Kansas.....	316	70-S-5	Pike	8.810 Mi.	Grading, drainage structures.	62,719.93
Griffin & Harville, Gurdon, Ark.....	317	24-S-5	Nevada	7.912 Mi.	Grading, drainage structures.	24,180.64
P. W. Fletcher, Hannibal, Mo.....	359	19-S-3	Nevada	6.844 Mi.	Gravel surfacing.	28,360.39
Winstead & Gunter, Siloam Springs, Ark.....	416	22-S-1	Sebastian	7.973 Mi.	Grading, drainage structures.	49,587.31
F. L. Scull, Conway, Ark.....	503	25-S-4	Independence	181.8 Ft.	Steel and concrete bridge.	13,168.13
Pioneer Construction Company, Kansas City, Mo.....	504	63-S-2	Sharp	224.11 Ft.	Steel and concrete bridge.	21,727.79
M. E. Gillioz, Monette, Mo.....	616	6-S-6	Hot Spring	12.412 Mi.	Grading, drainage structures.	128,401.76
Jas. Spencer & Son Const. Co., Mulvane, Kansas.....	617	70-S-8	Garland	17.227 Mi.	Grading, drainage structures.	123,326.53
W. L. Davis, Kansas City, Mo.....	618	64-S-8	Faulkner	4.483 Mi.	Grading, drainage structures and gravel surfacing.	29,199.48
R. O. Gwin, Sheridan, Ark.....	621	9-S-4	Hot Spring	16.544 Mi.	Grading, drainage structures.	64,285.00
W. L. Davis, Kansas City, Mo.....	831	64-S-7	Conway	5.100 Mi.	Gravel surfacing.	15,969.75
Earnest Euler, Mansfield, Mo.....	823	5-S-9	Baxter	15.450 Mi.	Grading, drainage structures.	84,910.53
C. M. Greene, Lowell, Ark.....	924	16-S-4	Madison	8.396 Mi.	Grading, drainage structures.	72,075.60
J. F. Mullins, Pine Bluff, Ark.....	1004	39-90-S-1	Greene-Clay	626.67 Ft.	8 treated timber pile bent bridges.	18,587.39
Forcum James Construction Co., Dyersburg, Tenn.....	1030	14-S-13	Poinsett	8.122 Mi.	Grading, drainage structures and gravel surfacing.	115,081.45
F. D. Harvey & Co., Jonesboro, La.....	1039	1-S-21	Clay	2.580 Mi.	Grading, drainage structures and gravel surfacing.	85,881.05
Forcum James Construction Co., Dyersburg, Tenn.....	1043	14-S-13	Poinsett	7.769 Mi.	Grading, drainage structures and gravel surfacing.	74,742.85
Kochitzky Bros., England, Ark.....	1102	15-S-8-9	Lonoke and Jefferson	6.382 Mi.	Grading, drainage structures and gravel surfacing.	67,006.68
P. F. Conngly Pav. Co., Little Rock, Ark.....	629	70-S-14-15	Lonoke	5.476 Mi.	Double bituminous surface treatment.	26,144.30

Record of Road and Bridge Contracts Awarded from Jan. 1 to Dec. 1, 1927.

NAME AND ADDRESS OF CONTRACTOR	STATE JOB No.	ROAD and SECTION NUMBER	COUNTY	Length in Miles or Ft.	NATURE OF WORK	Total of Contract Award Plus Material Furnished by State
M. Tansey, Bastrop, La.	719	24-S-6	Ouachita	12.215 Mi.	Grading, drainage structures.	71,544.55
Philpott Construction Company, Pine Bluff, Ark.	720	115-S-1	Union	3.746 Mi.	Grading, drainage structures and concrete pavement.	100,204.61
R. J. Lynch, Little Rock, Ark.	723	35-S-5	Cleveland	4.815 Mi.	Grading, drainage structures and gravel surface.	28,725.78
C. H. Atkinson Paving Co., Chillicothe, Mo.	736	2-S-7	Union	273 Ft.	Treated timber trestle bridges.	8,404.42
Lakeside Br. & Steel Co., No. Milwaukee, Wisconsin.	800	7-S-10-11	Pope-Yell	2,045 Ft.	Steel and concrete bridge.	534,137.35
Cook & Ransom, Ottawa, Kansas.	805	22-S-3-4	Logan	11.741 Mi.	Grading, drainage structures.	72,734.11
Lahar Bros., Springfield, Mo.	1018	39-S-2	Clay	0.967 Mi.	Grading, drainage structures and gravel surfacing.	6,245.22
Lahar Bros., Springfield, Mo.	1019	39-S-1	Greene	5.344 Mi.	Grading, drainage structures and gravel surfacing.	44,773.72
Lahar Bros., Springfield, Mo.	1023	90-S-1	Clay	6.522 Mi.	Grading, drainage structures and gravel surfacing.	79,847.27
S. C. Taylor, Birmingham, Ala.	1025	67-S-22	Clay	0.318 Mi.	Grading, drainage structures and gravel surfacing.	6,163.14
E. E. Davis & Co., Oklahoma City, Okla.	121	16-S-18	Cross	13.882 Mi.	Grading, drainage structures and gravel surfacing.	102,276.47
Miss.-Ark Construction Company, Little Rock, Ark.	123	78-S-1	St. Francis	1.178 Mi.	Grading, drainage structures and gravel surfacing.	11,670.23
Joe Selz Construction Co., McGehee, Ark.	217	13-S-7	Jefferson	8.442 Mi.	Grading, drainage structures and gravel surfacing.	58,701.58
Reynolds & Sutton, Tyler, Texas.	323	24-S-2	Howard	11.293 Mi.	Grading, drainage structures.	79,030.37
W. P. McGeorge & Co., Pine Bluff, Ark.	324	27-S-5	Pike	7.604 Mi.	Grading, drainage structures.	126,774.49
Richardson Ayres, Hope, Ark.	342	71-S-5	Sevier	345 Ft.	Reinforced concrete deck girder bridge.	28,188.58
C. H. Atkinson Paving Co., Chillicothe, Mo.	347	8-S-5	Clark	7.623 Mi.	Gravel surfacing.	28,004.08
Hinson Bros., Muskogee, Okla.	406	71-S-10	Crawford	8.219 Mi.	Grading, drainage structures.	93,089.29
Williamson & Williams, Batesville, Ark.	505	11-S-17	Sharp	5.000 Mi.	Grading, drainage structures.	41,864.86
W. L. Davis, Kansas City, Mo.	507	R. I. D. 2	Jackson	8.385 Mi.	Gravel surfacing.	53,664.21
A. A. Davis Co., Kansas City, Mo.	508	R. I. D. 2	Jackson	5.946 Mi.	Gravel surfacing.	15,870.93
A. A. Davis Co., Kansas City, Mo.	509	R. I. D. 2	Jackson	3.874 Mi.	Gravel surfacing.	18,003.21
B. H. Heard, Little Rock, Ark.	512	16-S-11	Cleburne	129.5 Ft.	Two concrete bridges.	10,149.84
M. K. Orr, Tschals, Miss.	519	14-S-12	Jackson	1,520.5 Ft.	Bridges.	40,496.82
Bradley & Talbert Construction Co., Sheridan, Ark.	619	35-S-1	Saline	8.201 Mi.	Grading, drainage structures.	54,983.73
Stanley, Fowler & Kennedy Const. Co., Malvern, Ark.	620	67-S-7	Hot Spring	10.687 Mi.	Grading, drainage structures.	53,268.21
Stanley, Fowler & Kennedy Const. Co., Malvern, Ark.	628	6-S-7	Hot Spring	5.703 Mi.	Grading, drainage structures and gravel surfacing.	30,107.81
Browne & Ross, Arkadelphia, Ark.	727	4-S-12	Bradley	12.515 Mi.	Grading, drainage structures and gravel surfacing.	104,219.03
R. J. Lynch, Little Rock, Ark.	731	11-S-1	Cleveland	1.992 Mi.	Grading, drainage structures and gravel surfacing.	18,938.10
J. A. Perdue & Co., Pine Bluff, Ark.	735	15-S-3	Bradley	6.000 Mi.	Gravel surfacing.	33,622.54
J. N. George & Bros., Centerville, Ark.	806	7-S-10	Yell	8.039 Mi.	Grading, drainage structures.	34,805.71
J. N. George & Bros., Centerville, Ark.	807	7-S-10	Yell	6.453 Mi.	Grading, drainage structures.	58,637.44
M. E. Gillioz, Monette, Mo.	903	65-S-1	Boone	11.134 Mi.	Grading, drainage structures.	72,925.70
A. A. Davis & Co., Kansas City, Mo.	1021	67-S-22	Clay	11.553 Mi.	Grading, drainage structures.	37,705.54
United Construction Co., Cincinnati, O.	131	50-S-1	St. Francis	289.7 Ft.	Treated timber bridges.	8,327.00
Sam B. Boyd, Columbia, Mississippi.	341	24-S-5	Nevada	11.554 Mi.	Grading, drainage structures.	52,754.14
Richardson Ayres, Hope, Ark.	349	27-S-5	Pike	7.307 Mi.	Grading, drainage structures.	41,878.23
Ware Construction Co., Little Rock, Ark.	506	11-S-14	Independence	9.027 Mi.	Grading, drainage structures.	86,345.76
Hope & Lybrand, Sheridan, Ark.	622	35-S-3	Grant	15.739 Mi.	Grading, drainage structures and gravel surfacing.	85,031.10
S. E. Evans, Clarksville, Ark.	623	67-S-9	Saline	4.028 Mi.	Grading, drainage structures.	25,744.55
Ellis & Lewis, Muskogee, Okla.	725	2-S-4	Columbia	10.358 Mi.	Grading, gravel surfacing.	90,198.61
C. H. Atkinson Paving Co., Chillicothe, Mo.	737	35-S-5	Cleveland	63 Ft.	Concrete girder bridge.	5,916.50
Maxwell Construction Company, Columbus, Kansas	808	22-S-4	Logan	338 Ft.	Concrete girder bridge.	26,074.20
Blackshire & Blackshire, Harrison, Ark.	930	101-S-2	Marion	514.5 Ft.	Steel bridge approach spans.	31,029.53
Davis Construction Co., Booneville, Mo.	1022	67-S-21	Randolph	6.049 Mi.	Grading, drainage structures and gravel surfacing.	95,198.38
Gibson & Robins, Hoxie, Ark.	1024	67-S-18	Lawrence	2.800 Mi.	Grading, drainage structures and gravel surfacing.	18,857.17
W. J. Runyan Paving Co., Sheffield, Ala.	1026	67-S-21	Randolph	8.028 Mi.	Grading, drainage structures and concrete pavement.	202,645.15
Bunnell & Mack, Paragould, Ark.	1070	18-S-4	Craighead	180 Ft.	Concrete bridges.	15,780.13
Geo. W. Nickels & Son, Hot Springs, Ark.	1100	70-S-6-7	Hot Spring-Montgomery	8.839 Mi.	Grading, drainage structures.	63,646.44
Forcum James Construction Co., Dyersburg, Tenn.	132	1-S-8	Phillips	6.058 Mi.	Gravel surfacing.	39,295.08
Forcum James Construction Co., Dyersburg, Tenn.	222	13-S-6	Lincoln	12.414 Mi.	Grading, drainage surfacing and gravel surfacing.	65,033.53
Kochitzky Bros., England, Ark.	246	114-S-1	Lincoln	8.683 Mi.	Grading, drainage structures and gravel surfacing.	75,446.86
Maxwell Construction Co., Columbus, Kansas	319	70-S-5	Pike	135.62 Ft.	Concrete bridge structures.	12,987.19
F. E. Wright, Gurdon, Ark.	329	4-S-4-5	Howard and Hempstead	9.890 Ft.	Grading, drainage structures.	20,561.54
Interstate Construction Co., Paris, Texas	410	10-S-1	Sebastian	13.056 Mi.	Grading, drainage structures.	75,980.36
C. N. Geren & Son, Fort Smith, Ark.	414	22-S-2	Franklin	8.757 Mi.	Grading, drainage structures.	44,345.12
Interstate Construction Company, Paris, Texas	417	8-S-1	Polk	12.698 Mi.	Grading, drainage structures.	120,064.91
Ware Construction Co., Little Rock, Ark.	523	11-S-14	Independence	7.009 Mi.	Grading, drainage structures.	69,661.73
J. C. Elliott & Co., Leola, Ark.	631	46-S-2	Grant	7.070 Mi.	Grading, drainage structures and gravel surfacing.	44,581.29
C. H. Atkinson Paving Co., Chillicothe, Mo.	639	6-S-6	Hot Spring	350 Ft.	Four concrete girder bridges.	34,294.52
Atkinson Bros., Pine Bluff, Ark.	722	167-S-2-3	Union and Ouachita	9.575 Mi.	Grading, drainage structures.	69,416.34
Atkinson Bros., Pine Bluff, Ark.	732	115-S-1	Union	4.944 Mi.	Grading, drainage structures.	33,232.59
Rowan & Rickard, Pine Bluff, Ark.	740	3-S-2	Columbia	0.511 Mi.	Grading and concrete pavement.	14,824.55
Cook & Ransom, Ottawa, Kansas.	801	22-S-4B	Logan	13.913 Mi.	Grading, drainage structures.	108,763.08
B. F. Brooks Construction Company, Dallas, Texas.	810	105-S-1A	Pope	5.833 Mi.	Grading, drainage structures.	46,888.32



A story is going around the financial district about an old southern negro who was asked by the proprietor of a store how he happened to need credit when he'd had such a good cotton crop.

"De ducks got 'bout all dat cotton, sah," was the mournful reply.

"What do you mean the ducks got it?"

"Well, you see," explained the old man, "I sent dat cotton up to Memphis an' dey deducks the freight, an' dey deducks the storage charges, an' dey deducks the commission, an' dey deducks the taxes—yes sah, de ducks got 'bout all dat cotton an' dat's why I'm here."

IN DETAIL

A colored laborer, doing a hauling job, was informed that he could not get his money until he had submitted an itemized statement. After much meditation, he evolved the following bill:

"3 comes and 3 goes at 4 bits a went—\$3."

It Won't Be Long Now

A bricklayer said to a foreman on a new job: "I'd like to work here, but I can't find a place to park my car."

The foreman replied: "I guess you won't do. This is a high class job and we want only bricklayers who have chauffeurs."—*Oakland Ad Club.*

"Don't you know," said Charlie Hedger, "that you can't sell life insurance without a license?"

"Boss," said the darky, "I knowed I couldn't sell it, but Ah didn't know the reason."—*Spokane Ad Club.*

MacGregor: "Are you the mon who cut ma hair last time?"

Barber: "I don't think so, sir. I've only been here six months."—*Missouri Pacific Lines Magazine.*

Ecezema: "What would any Christian woman be doing out this late in a car?"

Dandruff: "The same thing a heathen woman would, I presume."

"Come, come, my man, you have been looking around a long time without buying. What do you want?"

"Guess I want another floorwalker," said the gentleman addressed. "I'm the owner of this outfit."—*Pot and Kettle.*

Sweet Meats

I never sausage eyes as thine,
And if you'll butcher hand in mine,
And liver round me every day,
We'll meat life's frown with life's caress,
And cleaver road to happiness.

—*The Retail Druggist.*

Little Johnny, a city boy in the country for the first time, saw the milking of a cow. "Now you know where the milk comes from, don't you?" he was asked. "Sure," replied Johnny. "You give her some breakfast food and water and then drain her crankcase."—*Pure Oil News.*

Best He Could Do

Grocer, rushing into the newspaper office: "See here, you've published an announcement of my death by mistake. That's got to be fixed up somehow!"

Editor: "Well, we never contradict anything we have published, but I'll tell you what I'll do. I'll put you in the births column tomorrow and give you a fresh start."—*Progressive Grocer.*

The Losing Game

The big car was speeding toward a railroad crossing when a fast moving freight train came in sight. Immediately, the two men in the front seat began an argument as to whether or not they could beat the train.

"Don't get excited," cried the driver. "I tell you I can easily make it."

"And I tell you y' can't," shouted the other man. "The train will beat us by two minutes."

The driver kept increasing the speed of the car while the argument continued. Finally the man in the rear seat, who up to this time had remained quiet, could stand it no longer.

"Well," he shouted, "I don't give a darn who wins this race, but I hope it ain't no tie."

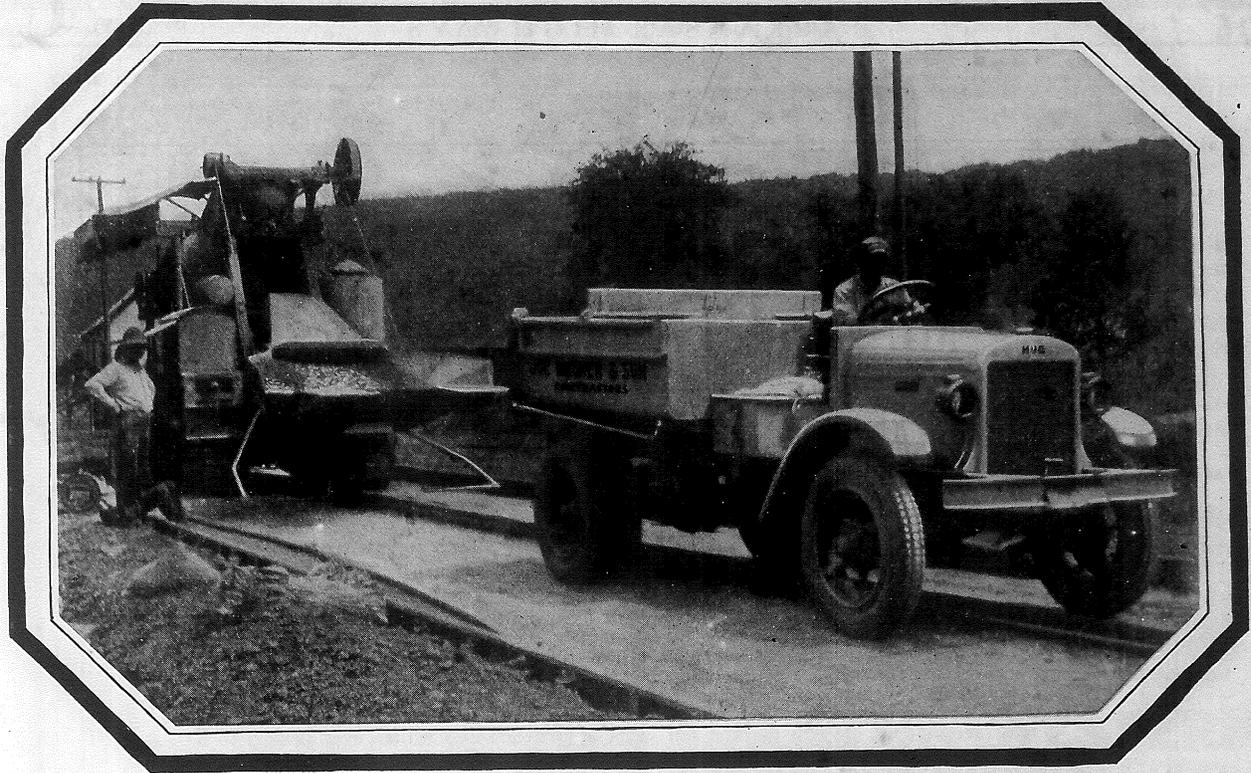
A Confirmed Optimist

A negro waiter employed in a certain cafe "sees good in everything." One afternoon a customer entered and ordered soft-shelled crabs. When they had been served he said to the waiter, "Henry, these crabs are very small."

"Yessah."

"And they don't seem very fresh either."

"Well, suh, it's lucky den dat dey's small, ain't it."—*Pickup.*



Model 80 Hug Roadbuilder in operation on Pennsylvania Highway

Hug Roadbuilding Transportation Equipment is Designed for Roadbuilding—

THE position of prominence gained by Hug Roadbuilder Trucks in the roadbuilding field is the direct result of specialization and concentrated effort in the building of transportation equipment designed to meet definite operating conditions. Speed—power—endurance and continuous service are the requirements of present roadbuilding transportation. A capacity for speed on the highway—power in a pull—endurance and

continuous service are the qualities that have developed big Hug fleets where Hug performance has proved its superiority on the road job.

Visit the Hug Exhibit at the Road Show. The latest Hug Roadbuilder Models and other Hug equipment will be on display—including the Hug Ready Mix Concrete Rear Bottom Dump Body—the Hug Sub-grading Machine, Turntable and Template—Space—WW-58.

THE HUG ARKANSAS TRUCK CO., Distributors
421 East Markham Street—LITTLE ROCK, ARKANSAS

The HUG Co.

Highland, Illinois

A Statement to the Public by L. W. Baldwin, President of the

MISSOURI PACIFIC LINES

"The Refinement of Service"

"SERVICE," "co-operation," and phrases like "mutual understanding" and "helpful appreciation" have virtually taken on new meanings in recent years. Where formerly they were merely words, now they are alive, vibrant with distinctive application. "Service," especially has come to be the watchword—the slogan—and, in many instances, virtually the religion of aggressive, progressive civic and industrial institutions. Cynical writers may jeer and jibe at "Babbits" and "Rotarians" but, nevertheless, it is a fact that we have in the last ten years approached closer than ever before, to a practical application of the Golden Rule.

The Missouri Pacific Lines was one of the first of the great industrial institutions in America to recognize this great truth and apply it in daily usage. The entire personnel of the Missouri Pacific Lines' army—60,000 strong—has won the admiration of the whole country as a result of the honest, untiring, constant effort to provide adequate, dependable and satisfactory SERVICE.

Having been one of the pioneers in the development of the new era of SERVICE, this organization now is blazing a new trail along the path of PROGRESS. This new movement can be and also is expressed in a single word—"REFINEMENT."

The traveling and shipping public is learning that a thing like railroad transportation, or service, can be refined. And when an army of 60,000 determined people move on a given objective with a fixed determination there can be no question regarding the result.

This is the explanation of the smoothly handled passenger trains on the Missouri Pacific Lines. It accounts for the unusual and distinctive dining car service on our trains and it also accounts for the innumerable little courtesies travelers and shippers receive from Missouri Pacific Lines' men and women everywhere—on trains, at ticket windows, in offices and on the telephone. It accounts for the absence of unnecessary noises, so far as they can be eliminated, in the vicinity of sleeping cars at night in Missouri Pacific yards and stations.

Admittedly the Missouri Pacific is profiting as a result of this REFINEMENT that is a part of all Missouri Pacific Service. But our greatest reward is the knowledge that, as a result of our efforts, a journey has been made more pleasant and comfortable, or a shipment of freight has been handled to the satisfaction of and frequently better than was expected by the shipper or receiver.

Time is working great changes in all things, including railroad transportation service. The one thing that is not changing is the determination of the Missouri Pacific Lines' organization to be of greatest possible service, and the sincerity of the Holiday Greetings and Good Wishes extended to all of our patrons and friends by every individual in the Missouri Pacific Lines' family.

I solicit your co-operation and support.



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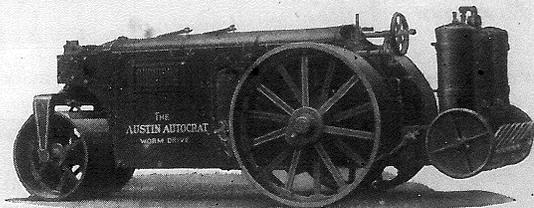
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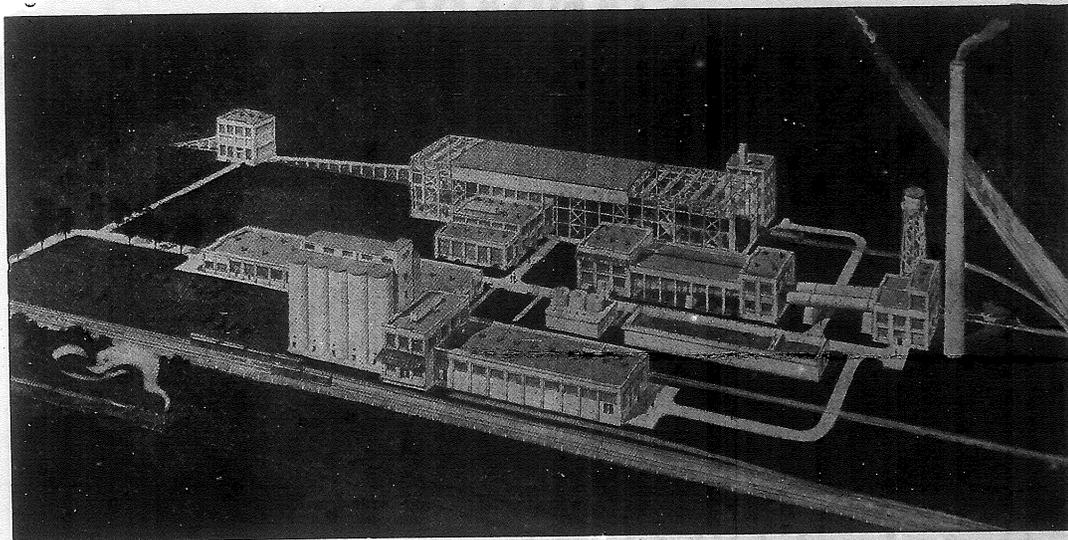
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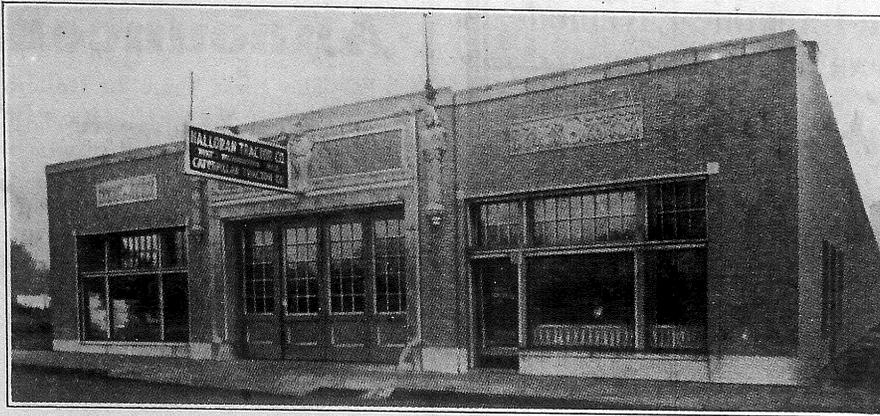
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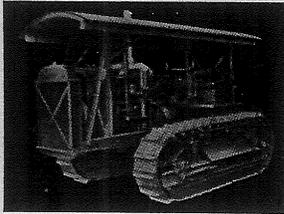
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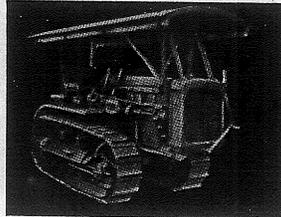
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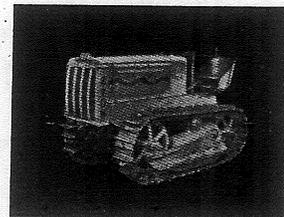
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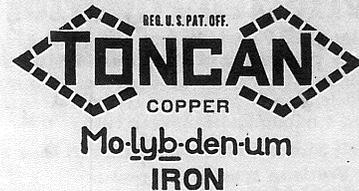
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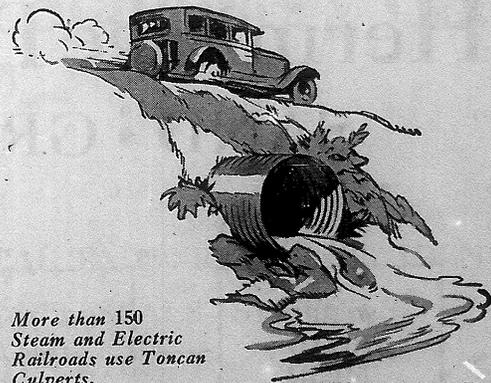
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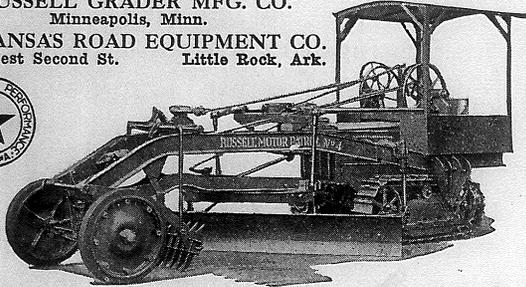
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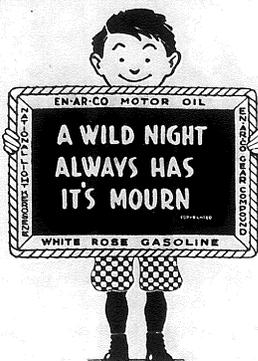
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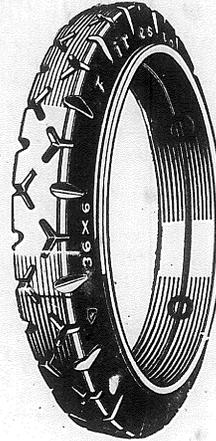
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Field investigation of some 18,000 culverts indicates the five principal types of culvert failures are:

- 1 **CRACKING:**
Due to load of traffic and fill on brittle material. Can be avoided by using elastic materials.
- 2 **DISJOINING:**
Caused by lateral soil movements and poor foundations. Can be minimized by using culverts having a positive bond between adjoining sections.
- 3 **BREAKING:**
Due to impact of traffic on culverts under shallow fill. Can be avoided by using flexible type culverts.
- 4 **UNDERMINING:**
Caused by erosion of foundations. Can be minimized by using a type of culvert adaptable to unusual conditions.
- 5 **DISINTEGRATION:**
—Of Porous Materials
Caused by freezing and thawing. Can be avoided by using a non-porous material.
—OF Metallic Materials
Caused by electrolytic action due to the presence of impurities in the metal. Can be minimized by using culverts made of a metal containing a minimum of impurities—**ARMCO INGOT IRON.**

Armco culverts provide protection against the greatest number of destructive elements

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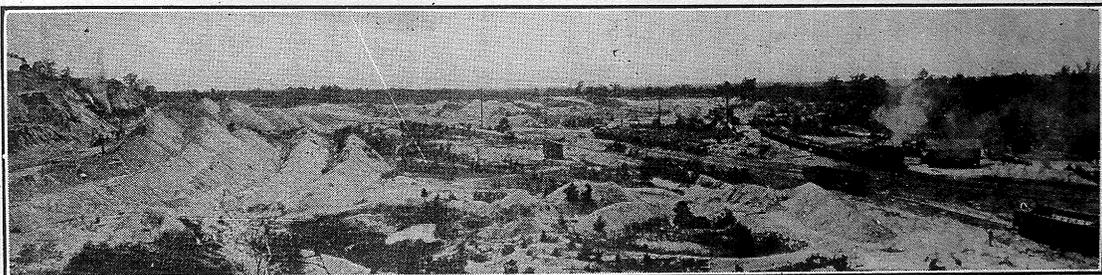
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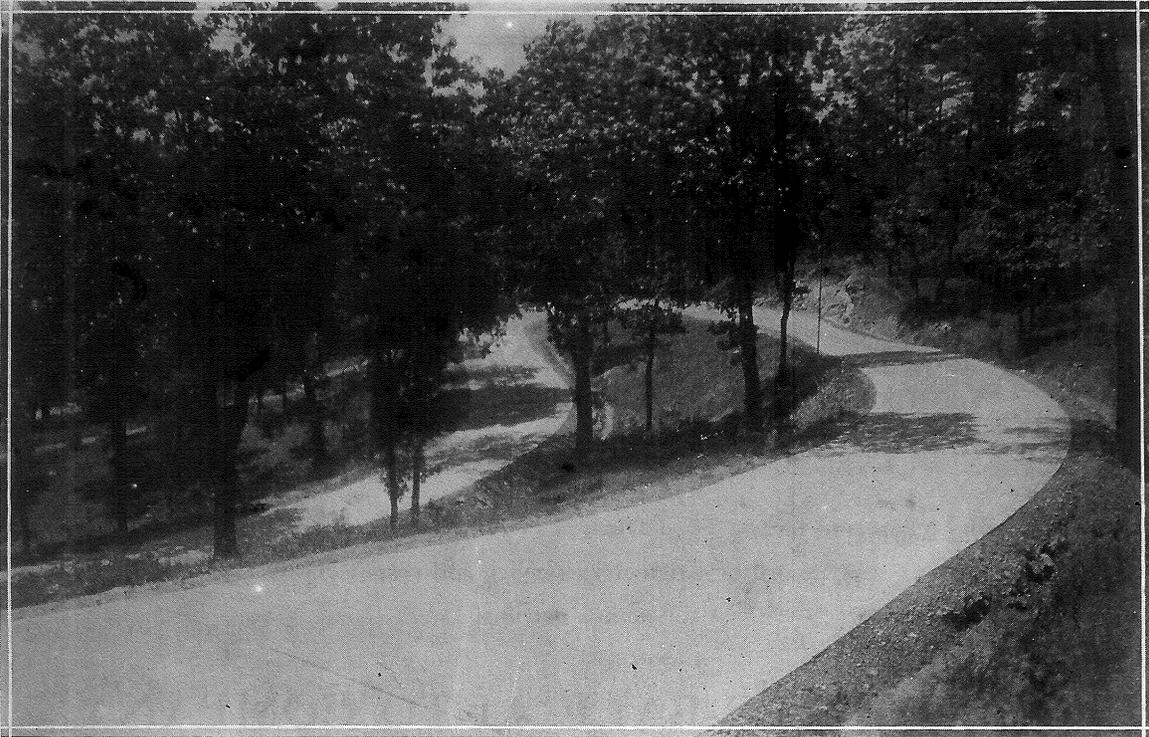
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