

ARKANSAS HIGHWAYS

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



CHARLES S. CHRISTIAN, New Chief Highway Engineer

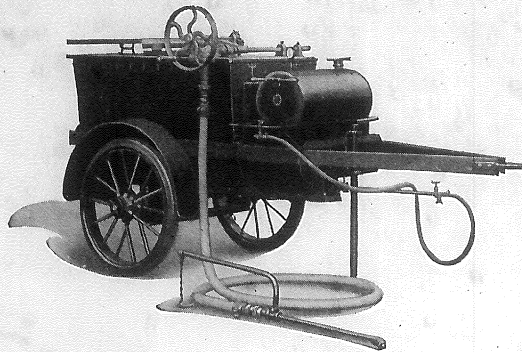
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No. 7

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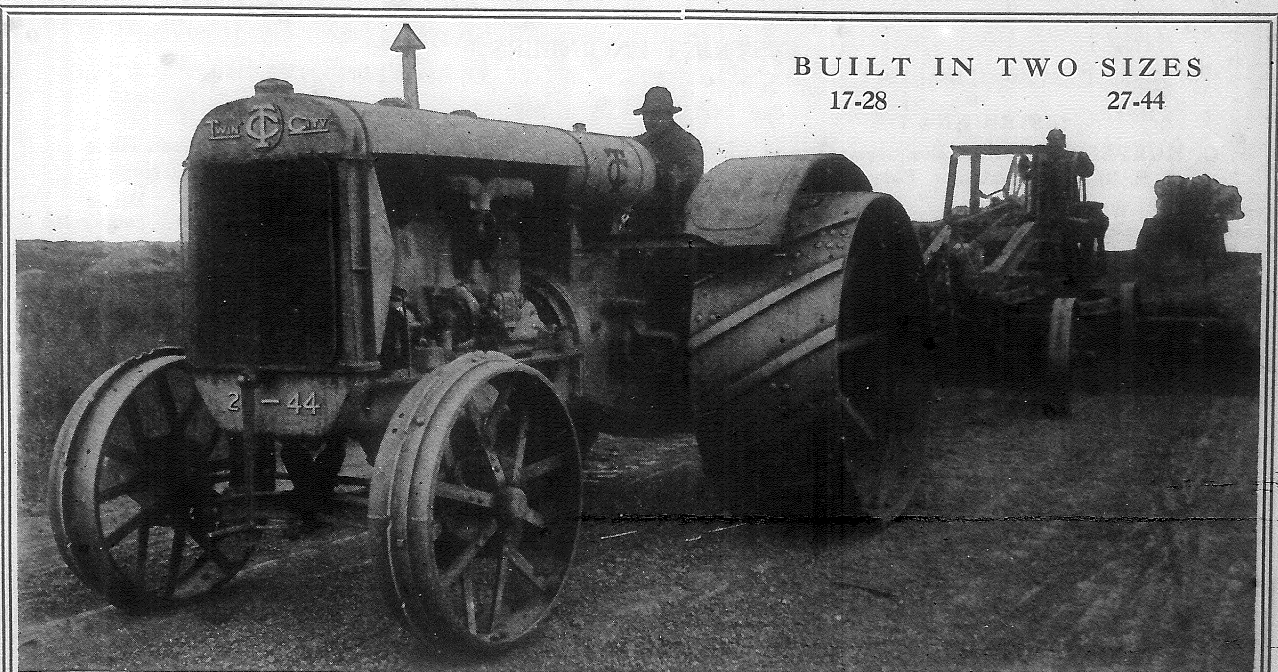
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*Official Monthly
Magazine*



*State Highway
Department*

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JULY, 1927

No. 7

BE PATIENT

By DWIGHT H. BLACKWOOD, State Highway Commissioner

The delays—and they are necessary delays—in getting started on the big road building campaign made possible under the provisions of the Martineau Road Bill are just as objectionable to the members and Chairman of the Highway Commission, and to all those connected with the Highway Department as they are to the public. But there are some details that simply have to be worked out in connection with getting such a big enterprise as a \$52,000,000 road building project under way. that unavoidably take time.

No time is being actually lost. Plans for a full-steam-ahead mode of operation are being made while the legal and financial details are being completed.

The ten districts will be visited by the Chairman of the Commission and one or more members of the Commission regularly. This plan it is hoped will enable the Highway Department and the public to all be working to the same end and to the best possible advantage.

A trip through District No. 3, more commonly known as the Magnolia District has resulted in the Department obtaining first hand and valuable information, and seemingly left those so greatly interested in their roads being immediately builded thoroughly convinced that the best possible speed is being made.

Just bear this in mind, Arkansas is going to get roads, some good roads and roads built to last and for the least possible cost.

Charles S. Christian Appointed Chief Engineer

Charles S. Christian, well known engineer of Texarkana, has been appointed Chief Engineer of the State Highway Department by Commissioner Blackwood, succeeding O. L. Hemphill, who resigned to enter the contracting business. The selection of Mr. Christian received the unanimous approval of the Honorary Board of Highway Commissioners.

Mr. Christian is one of the ranking engineers of the South, and it was only after much pressure was brought to bear that he consented to accept the position.

Mr. Christian is a native of Missouri. He entered the engineering profession in 1900. In 1911, he moved to Texarkana, and opened an engineering office at that place. Since moving to Arkansas, he has handled practically all the levee work on that part of Red River lying within the State, serving as Secretary and Chief Engineer of two of the largest Levee Districts in that section of the State. He has also been actively connected with practically all road building and paving projects of that section. Mr. Christian was one of the prime movers in the recent flood control meeting called by Governor Martineau.

He is a member of the American Society of Civil Engineers; the American Association of Civil Engineers and the Arkansas Engineers Club.

Mr. Christian's engineering ability coupled with his wide experience makes him especially fitted to capably fill the important position to which he has been appointed, and it is certain that Commissioner Blackwood's wise selection of Mr. Christian will meet with hearty approval of all those interested in the good roads program of Arkansas.

One of Mr. Christian's first official acts was to call a meeting of the District Engineers and their assistants, and plans for the year's road building program were formulated. These plans included the dividing of the State into two divisions—Eastern and Western. These divisions will be in charge of a division engineer who will hold the rank of Assistant Highway Engineer.

E. N. Jenkins of Pine Bluff has been appointed chief of the Eastern Division, and W. W. Mitchell of Fort Smith will be chief of the Western Division. Both of these gentlemen are engineers of outstanding ability and attainments.

Another change instituted by Mr. Christian is that of turning over to the District Engineers the work of

making plans and surveys of all projects in their particular districts. In this way, surveys can be made more quickly and more accurately, and construction begun sooner on the many projects already laid out by the Commission.

Each district will have its own locating crews and drafting department, in other words, each district will be an almost complete Highway Department within itself. Only a small force of draftsmen will be maintained at the Little Rock office, and their duties will consist mainly of checking over the work sent in from the districts. The regular Plans and Surveys Department has been discontinued.

THE HIT AND RUN DRIVER

The motorist who deliberately steps on the gas and disappears around the corner after an accident, not stopping to see how badly the victim is injured, hasn't an excuse in the world for his action. And yet many of them do it.

The impulse to run away rather than face the music is an inherent human characteristic perhaps, but it is one that should be discouraged.

The courts are uniformly severe upon such offenders, but unfortunately they often escape, due to the fact that no one present happens to get the number of the license.

The Detroit Automobile Club is waging a successful war against the "hit and run" driver by paying a reward of \$100.00 to anyone who is instrumental in bringing him to justice. This reward makes bystanders particularly alert when an accident happens. There is small chance for the reckless driver to make his getaway safely.

This plan is recommended to communities where this crime is prevalent. If all the automobile clubs of America would adopt the rule it would go far toward curbing the habit of running away after the damage is done.

"What's the trouble, son?" said the kindly stranger.
"My pa and ma won't take me to the movies," sobbed the opprest child.

"Do they ever take you when you make a noise like that?" inquired the stranger.

"Sometimes they do and sometimes they don't," sobbed the poor boy; "but it ain't any trouble to yell."

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Road and Bridge Projects Awarded

Bids were received and opened in the office of State Highway Commissioner Dwight H. Blackwood on June 30th involving 21 projects of new construction. This represents the first letting under the Martineau Road Act. The projects and successful bidders are as follows:

F. A. 229-A, Warren-North, concrete paving, 6.306 miles in length, Bradley County. Awarded to the Lawrence Construction Company for \$146,430.16.

F. A. 226-A, Camden-Hampton, gravel surfacing, 14.788 miles in length, in Calhoun County. Awarded to the Miss.-Ark. Construction Company for \$24,602.35.

C-115-S3-A, Thornton-Hampton, grading and minor structures, 16.828 miles in length, in Calhoun County. Awarded to Lynch & Hill for \$48,964.69.

C-59-S1-A, Eudora-Kilbourne, gravel surfacing, 7.81 miles in length, in Chicot County. Awarded to Selz Construction Company for \$13,169.30.

C-2-S4-C, Village-Union County line, grading and all structures, 3.163 miles in length, in Columbia County. Awarded to the Miss.-Ark. Construction Company for \$18,811.59.

F. A. 215-B, Hope-Lewisville, grading and all structures, gravel surface, 9.59 miles in length, in LaFayette County. Awarded to Tarrant & Miles Construction Company for \$43,251.63.

C-71-S1-B, Texas-Louisiana State line bridges, two reinforced concrete girder bridges, 200 feet in length, in Miller County. Awarded to McGuire & Cavender for \$16,286.35.

C-71-S1-A, Texas-Louisiana State line road, grading and minor structures, 7.950 miles in length, in Miller County. Awarded to J. G. Newkirk for \$42,776.22.

F. A. 192-C, Walnut Corner-Lee County line, grading and all structures, 6.058 miles in length, in Phillips County. Awarded to F. D. Harvey & Company for \$17,687.50.

C-167-S2-A, El Dorado-Smackover, grading and minor structures and paving, 10.814 miles in length, in Union County. Awarded to Kochtitsky & Prosser for \$321,811.15.

C-167-S2-B, El Dorado-Smackover, five reinforced concrete girder bridges, 355 feet in length, in Union County. Awarded to McGuire & Cavender for \$40,870.88.

All bids on the ten other projects advertised were rejected for various reasons. Because of the fact that they

were rejected at this time does not in any way mean that they will not be built as specified. However, a slight delay will be incurred in their construction due to the fact that they will have to be readvertised and awarded at some future date.

The projects rejected are as follows:

C-16-S11-A, Heber Springs-Edgemont road, grading and minor structures, 8.902 miles in length, in Cleburne County.

C-67-S4-A, Okolona-South, grading and all structures, 8.238 miles in length, in Clark County.

C-67-S6-A, Donaldson-Arkadelphia, grading and minor structures, 3.349 miles in length, in Clark County.

C-67-S7-A, Donaldson-Arkadelphia, grading and minor structures, 6.506 miles in length, in Hot Spring County.

C-67-S6-B, Donaldson-Arkadelphia, 8 reinforced concrete bridges, total length 1,516 feet, in Clark County.

C-67-S7-B, Donaldson-Arkadelphia, 3 reinforced concrete girder bridges, total length 246 feet, in Hot Spring County.

C-70-S4-A, Kirby-Dierks, grading and minor structures, 17.050 miles in length, in Pike County.

C-70-S4-B, Kirby-Dierks, alternate trusses and concrete girder bridges, 422 feet in length, in Pike County.

C-167-S3-A, Smackover-Camden, grading and minor structures, 12.783 miles in length, in Ouachita County.

C-167-S3-B, Smackover-Camden, 2 reinforced concrete girder bridges, total length 105 feet, in Ouachita County.

He Should Worry

At an Indiana hotel this sign is on all the stationery and in every room:

"This hotel is fully equipped with automatic sprinklers. Statistics show that loss of life has never occurred in a sprinklered building. In case of fire you may get wet, but not burned."

A witty guest composed the following prayer to fit the circumstances:

"Now I lay me down to sleep,
Statistics guard my slumber deep;
If I should die, I'm not concerned,
I may get wet but I won't get burned!"

CONSTRUCTION PROJECT ON WHICH BIDS WILL BE RECEIVED JULY 29, 1927

Project No.	Designation	County	Length	Nature of Work
Fed. Aid 240-B	Batesville-Heber Springs.....	Independence	10.953 Mi.	Gravel Surfacing.
Fed. Aid 242-A	Pheas Bridge-Paragould.....	Greene	7.765 Mi.	Grading, Drainage Structures, Gravel Surfacing.
Fed. Aid 244-A	Dardanelle Bridge.....	Yell and Pope	2.045 Mi.	Steel and Concrete Bridge over Arkansas River.
State C-71-515-A	Alma-Five Springs.....	Crawford	4.737 Mi.	Grading and Drainage Structures.
State C-4-510-B	Camden-Hampton Bridge.....	Calhoun	154 Ft.	Timber Bridge.

Highway Maintenance in Arkansas

By C. W. Holderbaum, Maintenance Engineer

The word "Maintenance" as applied to highways is defined by the Federal Bureau of Public Roads as "The constant making of repairs to preserve a smooth surfaced highway."

Note the words, "A smooth surfaced highway." If this is supplied the average modern traveler, it becomes in one respect similar to any organ of his body which is functioning perfectly—he is unconscious of it. He steps on gas, his mind is occupied with thoughts of destination. But let road become rough or corrugated, full of "pot holes," or perhaps develop an occasional stretch of deep ruts with mud and water, and the traveler becomes aware of the discomfort with a feeling of resentment against the conditions. When gathered with his fellow travelers in the hotel lobby, his remarks about the highway situation in general are likely to be uncomplimentary, and with particular reference to the highway maintenance, he will range all the way from a stern statement of facts, to a tirade of hostile criticism.

Highway Maintenance will gradually become the major problem confronting the Highway Department as transportation expands to meet modern demands; this must be, since at this time, it is not possible to conceive of a type of road that will not wear out when subjected to constant use.

The present State Highway System comprises 8,345 miles of roads, which may be classed as unimproved, graded, gravel surfaced and paved.

Of this mileage, 1,501 miles are as yet unimproved, being merely projected on the map, or at best, followed as wagon trails. Until these roads are located and opened for travel, the expenditure of State funds on them for maintenance could hardly be justified.

At present, 2,671 miles of the State System are graded earth roads and of this class, 1,503 miles are narrow, about 18 feet in width, and 1,168 miles are of standard width, or about 24 feet. Most of the small drainage structures and many of the bridges are in place on this entire mileage. Roads of this type cannot be classed as all year roads, but they will sustain light traffic very well for about eight months of the year.

The remaining four months usually include the winter season, with its attendant rains, and cold, damp weather. It seems that this period is always selected by the residents along a road, especially one that is newly opened, to haul logs, ties, stove-bolts, cord-wood and other timber products to their markets, and this hauling continues until the road becomes impassable on account of the deep ruts and mud holes. Under these conditions, maintenance work must practically be suspended, and the return of favorable weather awaited.

Of the present State System, 3,454 miles are surfaced with gravel, shale, chert, silica or similar material. On some of this mileage, where travel is heaviest, the surfacing has worn to a thin layer, and the same condition prevails on other portions where the surfacing was not put on to standard thickness. When necessary to restore a badly worn or thin gravel surface, seven hundred to one thousand cubic yards of gravel per mile is about the minimum that can be used. This amount would provide a three to four-inch layer, loose measurement, according to the width of the surfacing. Where

it is necessary to ship the gravel by rail, its cost in place on the road will average from \$3.00 to \$3.50 per cubic yard. Therefore it is evident that this item alone would cost from two thousand to three thousand dollars per mile and to this would be added other charges incidental to the work. Where local gravel is available, this cost would be reduced probably one-half.

In first cost, a gravel road is about the cheapest all year road to construct, and is a really economical road where the traffic does not exceed an average of 400 vehicles per day. When, however, the traffic mounts to an average of 1,000 vehicles per day as on some of our gravel road sections, this type becomes difficult to maintain without incurring excessive costs, and in some instances where the travel has greatly exceeded even the above figure, it is found utterly impossible, regardless of the amount expended, to maintain a satisfactory surface, and the only practical remedy is to replace with some higher type of surfacing.

All available cost data on gravel surfaced road maintenance in this and other States having considerable mileage of this type, show that such road requires an average annual expenditure of from six hundred to eight hundred dollars per mile to maintain, as many of them carry travel considerably in excess of 400 vehicles per day. Of our total mileage, 716 miles have some type of paving—this includes macadam, asphaltic and concrete surfaces. When roads of this type are constructed in accordance with modern design, they can be maintained under heavy traffic at a cost that will average near two hundred dollars per mile per year. However, some of the pavements in this State which were built under earlier conditions, will now require an expenditure of from one thousand to two thousand dollars per mile to place them in a satisfactory condition for maintenance under present traffic demands.

The maintenance allotment, as proposed under the new law, will permit an expenditure on the State Highway System as a whole of slightly less than three hundred dollars per mile per year. This amount must pay for all labor and team hire, for material such as gravel, stone, asphalt and bridge lumber, for the purchase of needed new equipment, and for repairs to the present State owned equipment, also for gasoline and other fuel and lubricants. Some idea of the magnitude of these expenditures may be gained from the statement that the gasoline and lubricants necessary to operate the seven hundred motor vehicles owned by the State will cost approximately two hundred thousand dollars per year.

Those who are charged with the responsibility of maintaining the State's highways realize the enormity of the task confronting them, both from a financial and a technical standpoint. It is a complex problem, due to the numerous factors involved, and the Department is often subjected to unjust criticism through failure of the public to understand and weigh the various reasons which tend to develop the conditions encountered. Constructive criticism, however, aids in directing conscientious effort, and when both the public and the employee, in a spirit of mutual helpfulness, strive toward the goal of better roads, the result sought will undoubtedly be attained.

AMERICA ON RUBBER

All are partners in the great industry of transportation. Since the dawn of history the elemental pursuits of man have been Agriculture and Commerce, and transportation over highways, waterways and railways (named in order of their use by man) has been necessary to feed, clothe and provide comfort to mankind.

With the exception of the alphabet and the printing press, nothing has done so much for mankind as transportation; and yet the Man of Nazareth, Father of our Faith, and George Washington, Father of our Country, living 1,800 years apart, knew only the same methods of transportation.

Highways have been a symbol of promise, of opportunity and of destiny since the beginning of time. Someone has said:

"Roads rule the world—not kings nor congresses, not courts nor constables, not ships nor soldiers. The road is the only royal line in a democracy, the only legislature that never changes, the only court that never sleeps, the only army that never quits, the first aid to the redemption of any nation, the exodus from stagnation in any society, the call from savagery in any tribe, the high priest of prosperity, after the order of Malchisedec, without beginning of days or end of life. The road is umpire in every war and when the new map is made, it simply pushes on its great campaign of help, hope, brotherhood efficiency and peace."

The earliest pages of Holy Writ mention highways while the Prophets foretell their coming. The story of Roman road building and world supremacy is the greatest tale of the early times. Learning the art of road building from the Carthaginians, the Romans became the greatest road builders in ancient days, when from the golden milestone in the forum in Rome twenty-four roads lead out to all parts of the empire of the Caesar's, with a total length of 52,904 Roman miles. Wherever the legions of Caesar marched, they built roads, flung bridges, captured the regions and cemented Rome into a nation with a common trade, a common language and common ideals, and finally when all "roads led up to Rome," the "Eternal City" became the world's center of commerce, art, learning and "ruled the world" because of her roads.

No nation can successfully endure unless she is tied up by travel. Sweden lost her liberties and her nationalism for two reasons, once upon a time. Lack of newspapers by which distant portions drifted apart in thought and unity of patriotism and purpose, and good roads that made them infrequent visitors and strangers, were the reasons for her fall.

All the advance in transportation has taken place since Fulton made the steamboat in 1806, followed by the steam locomotive in 1829. Prior to the advent of steam power, the world depended on its waterways for its heavy transportation. Since the beginning of time men "have gone down to the sea in ships," and in the early days of this country canals began to be used, all the while the roads being feeders for waterways.

With the coming of the railways in the United States, the building of highways stood practically at a standstill for three-quarters of a century. America was better served by the Indian roads of 1800 than she was by roads of her own building up to the Civil War

period. It was not until 1893 that the government of the United States established the office of Road Inquiry and in 1912 Congress created a commission to investigate the problem of highways and after three years a report was brought in and in 1916, Congress made its first real appropriation and the United States Bureau of Public Roads came into being.

All of the improvement in transportation during this period of the country's growth and development was generally in the direction of mass transportation—bigger boats and bigger trains.

It remained for the motor car to improve transportation in the other direction—that is for the individual—and its coming brought individual transportation and thus revolutionized the world's traffic and road making.

The constant demand for improved facilities of transportation which is a part of the make-up of every American, has called for the tremendous strides made in all lines in the past decade and a brief study of these will be interesting:

The total mileage in the United States is 3,001,825 with a total of 560,000 miles surfaced in some manner. 14 per cent of this mileage has better than dirt surface and 4 per cent has "high-type" surfacing, or rigid construction, two-thirds of which is concrete slabs. Under Federal Aid we have some 70,000 miles of improved roads. Our highway work in the United States now employs 500,000 men and uses a billion dollars each year. The total investment in the highway system and



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equipment, omitting city streets and rights-of-way is estimated at \$8,000,000,000 or a per capita investment of \$69.

With 22,330,000 autos rolling at the end of 1926, America has 81 per cent of all the motor cars in the world, 88 per cent of which are passenger cars. 4,480,000 cars were made in 1926 at an average retail cost of \$886 for passenger cars and \$1,090 for trucks. 64 per cent of these cars were bought on time and there is now outstanding \$1,378,000,000 in time paper on these cars. The government received in registration, gasoline, excise, municipal and personal motor taxes \$735,226,000 during 1926. Automobiles used 8,650,000,000 gallons of gasoline, 560,000,000 gallons of oil, 62,000,000 tires and 75,000,000 tubes last year. The total carrying capacity of these cars is 70,390,808 persons or thirty times the carrying capacity of all the railroads. The total auto-passenger miles for 1926 run 219,971,272,000, of which one-half is estimated to be on rural highways, which highways have then borne over three times as many persons as the railways, for the year.

Every day sees 31 miles of autos manufactured. These cars in line amount to one car for every four feet of area paved in cities last year, and one car for every 100 feet on all the streets and highways constructed last year. There are 53,360 dealers, 51,715 garages and 83,758 service stations in the country with no saturation point in sight for the industry in America. The automobile is not only an article of universal desire but is one that knows no political boundaries, calls for large expenditures and gives great returns, but is one that is calling for more and better highways. The autos made and sold in 1926 total a cost of more than 19 times the cost of all the roads and streets for the same period, while the cars sold in Louisiana alone cost 70 per cent of all the roads built in the entire country.

In the South, we find 6,000,000 autos rolling where a population of 40 million have six times as many cars as the three principal motor-using countries of Europe, viz: France, Germany and Italy with a population of 145,000,000 people. One car for each 6.6 persons as against one car for each 135. The next fifty years will bring an era of road building in America such as Rome never dreamed of. Twenty million motorists on the road last summer with an average of six million on tour every day in the year call for more mileage and better construction. We have not yet begun to build auto roads in the United States.

MOTOR TOURING INCREASES WITH MORE PAVED ROADS

Where four automobiles toured the country last year, five will travel this year, a survey of the tourist traffic situation indicates. The development of better roads and the widespread use of the motor car are the chief reasons for this great increase in auto vacationing.

Only a few years ago American tourists were flooding the coffers of foreign countries. This year some \$3,000,000,000 will be spent by American tourists, not abroad but in America. Highway associations, city tourist bureaus, and automobile clubs are all making plans for this great season which will bring out on the nation's highways 15,000,000 or more pleasure seekers riding in 5,000,000 automobiles.

The business of touring is now no longer confined to a few dry summer months for the building of all weather roads has lengthened the traveling season at least 60 days. With the increasing use of closed cars, the length of the touring season in some sections of the country will be governed chiefly by winter.

Accurate tourist traffic counts kept by the Wisconsin highway department disclose that one out of every seven automobiles on the roads during the vacation season is a tourist car. The increase of 70 per cent in tourist travel in Wisconsin in 1924 over 1919 is indicative of the growth all over the country. The Wisconsin survey reveals further interesting information in that the number of occupants per car is three and two-thirds persons who daily spend \$3.21 each. The length of the average Wisconsin tourist visit is nearly eleven days.

Not only the national parks are attractive to the tourist, for practically every portion of the country has its vacation spots. The national parks will accommodate approximately 2,000,000 tourists this year, while many States alone are expecting over a million visitors. The survey shows that the States which receive the greatest amount of tourist traffic are those which have built the best roads.

With such an unprecedented use of the highways for touring, and in consideration of the ordinary business demands made of the roads, it is not surprising to learn that more than a billion dollars will be spent this year in building and repairing them. A general trend for the building of better roads exists with many States adopting comprehensive paving programs.

During the 1926 road building season the mileage of concrete roads was increased from 37,660 miles to about 44,000 miles. Most of these roads were built in States of larger populations yet great mileages were laid by small States which have developed efficient means of acquiring permanent roadways. Many States are making broad plans for future highway building to accommodate the family of motor vehicle owners which by the end of 1927 will perhaps number 25,000,000.

Tourists on the whole are very particular souls. They will not travel in those States notorious for their bad roads. Despite the great increase in automobile vagabondage several States have reported that the number of vacationists has fallen off considerably. In some mysterious way word had gotten around to the touring world that the roads were to be avoided in those localities. Since most vacationists have but two or three weeks in which to see America, the first consideration in deciding their itineraries is that of roads which will get them some place and back again within the allotted time.

So with the building of better roads through the rural districts the vacation season will be still further lengthened and the business of touring America will become greater.

Oh the fish that got away were the
biggest ones of course,
But sad as it may seem, it might
have been much worse;
For the string that we brought back
was the best one of them all.
Try your luck in old New Hampshire
fore the law goes on next fall!

—Potter Spaulding.

World Peace Through International Roads

In early times there was a saying that a "Roman peace" was a world-wide peace—and highways built by the Romans were a potent influence in maintaining peace.

In modern times we have the same opportunity to cement the friendships of nations through the influence of highways. The advent of the automobile and its transition from a luxury to an economic necessity has made the better roads movement an international matter.

The National Bank of Commerce in New York has made a study of the international demand for road improvement and some of the conclusions of the report furnish an interesting commentary on the progress of road building in foreign countries.

Trunk highway development was practically neglected during the last half of the nineteenth century when railroads were thought to have supplanted roads permanently.

Existing roads, except those built primarily for automobiles, were intended for horse-drawn vehicles and have deteriorated rapidly under the speed and weight of the automobile. In those countries possessing good systems, the problem has been to conserve the present highways, and make them equal to the demands of modern traffic. Newer and less developed regions, such as Australia and South America, must answer the demand for improved highway transportation by building new roads.

France, well known for its fine roads and a pioneer in their construction, drainage and maintenance, has excellent national highways and the road problem there is largely a matter of deciding upon the most suitable surfacing. English roads in general compare favorably with the French. Striking unanimity prevails in reports from all parts of the world of increased registration of motor vehicles, and interest in, and plans for road building. In Scandinavia roads are now deemed so essential to the country's development that it is realized that future appropriations must be greatly increased to keep up with the growing volume of motor traffic. Poland has recently adopted an ambitious road program and Finland expects soon to have 30,000 miles of improved highways.

Development of good roads in Egypt is making rapid progress. Farther south in Africa, in Nigeria, in Southern Rhodesia and in the Union of South Africa there is public interest in the road problem. Despite political upheavals China is showing a genuine enthusiasm for road building and a growing realization of the necessity of highway development. Australia is planning to spend over \$16,000,000 on highway development this year and will devote \$100,000,000 to be expended on roads in the next 10 years. New Zealand's highway development is going ahead rapidly.

However, it is in Latin America that the most striking movement is taking place. Transportation means of any kind are inadequate in Latin America. Railroads have been built at heavy cost of money and energy but expansion of the highway system will probably come more rapidly because the public is already converted to the use of motor service. Several Latin-

American republics have ambitious programs, many of them being already well under way. Increasing ownership of automobiles, bringing the inevitable demand for good roads, has generally been responsible for the good roads movement in South American countries.

Highway expansion stands as the most significant transportation development since the advent of the railroads. Increasing motor-vehicle registration is the best indication of the wide sweep of this movement as a good-road program usually accompanies extended use of the automobile, although in turn, increased traffic follows improved highways. Among the incalculable economic benefits of good roads to a community are cheaper transportation costs, better standards of living, the opening up of potentially rich and unexploited districts formerly inaccessible, improvement of regions already served and a general increase of commercial activity.

American leadership in pavement surfaces has been one of the consequences of the tremendous development of the automobile industry in this country which has far outstripped similar development in other countries.

And so again highways have become agents for world peace and American engineers are doing their part to preserve the peace of the world through leadership in pavement design and construction.

COST OF POOR ROADS

An automotive engineer found that in one year the average automobile consumption of gasoline in North Carolina was reduced, by improved roads, from 521 to 454 gallons. That made a saving of \$16.76 per car.

Fuel, however, is only one of the various factors involved. The poor road wears out the whole car faster than the good road. The expense thus caused is far higher than most owners suspect.

An automobile dealer in Illinois, who carefully checked up the expense of operating on paved roads and dirt roads, found that the motorists saved, on an average, 2.4 cents a mile on the hard-surfaced highways. Another investigator put the saving a little higher. The average may be 2.5 cents a mile. Motor trucks may save as much as 5 cents a mile on good paved roads as against unimproved roads.

This is many times as much as any motorist or trucker pays in the form of road taxes on gasoline or otherwise.

VERY OPEN COUNTRY

A man had invited a business acquaintance to play a round of golf with him. The guest, who was a very pompous individual, was also a poor player and hacked up the turf with each stroke.

After he had carried away an unusually generous portion with his iron he turned to his host and said:

"You know I don't care particularly for the game, but I like the glorious open country hereabouts."

"Ah, quite," replied the other, as he surveyed the scarred ground, "but do you mind closing up the open country as we go along?"

Hug Company Opens Branch in Arkansas

The Hug Company, manufacturers of Hug Motor Trucks, announces the opening of a sales and service branch at Little Rock, Arkansas. The new branch will be in charge of Mr. W. P. Grace, who is thoroughly familiarized with the Hug line of trucks and equipment and who has had considerable experience in the road-building machinery field. A complete line of trucks and parts will be stocked at the new branch.

The Hug Truck is being used extensively by road-builders and contractors throughout the country, and has established remarkable performance records wherever used, and under the most extreme operating conditions. The truck was designed by C. J. Hug, who previous to entering the truck field was engaged in roadbuilding and contracting in Central Illinois. During his roadbuilding experience, Mr. Hug realized the need of a specialized truck for the specific purpose of roadbuilding and consequently designed the first Hug Truck for his own use. The success of the first Hug Truck was so conspicuous that Mr. Hug was forced to discontinue roadbuilding work, and devoted his entire attention to building Hug Trucks. That the Hug Truck has met with the approval of roadbuilders and contractors is indicated by the fact that the Hug Company is still supplying Hug purchasers with additional trucks. Three large contractors are now operating over 50 trucks each, and the Hug Company recently received another order from the General Material Company, of St. Louis, Mo., for 50 trucks. In addition to furnishing roadbuilders and contractors with transportation equipment, the Hug Company is also supplying counties and State Highway departments with transportation equipment. The State Highway Department of Tennessee recently purchased six of the two-yard gravity type roadbuilder models.

The Hug Truck is adapted for particularly every kind of dump truck work. At the present time, the Hug Company is in production on three standard models of trucks. Model 60, the smallest Hug Roadbuilder, is rated as a two-ton truck, has a maximum load capacity of 6,500 pounds, and is equipped with a two-yard gravity type body. The gravity type body is of special Hug design, and is an exclusive feature on the Hug chassis. This model is particularly adapted for single batch hauling. Model 80, is a 2½-ton truck, with a maximum load capacity of 8,500 pounds. This model is equipped with a 3-yard power hoist body. The design of the chassis permits the hoist to be mounted in between the frame, thereby permitting a low center of gravity and an even balanced load distribution. This model truck will accommodate two six-sack bag batches, 1-2-3½ mix, and is used extensively for batch hauling. Model 88 Hug Roadbuilder is rated as a 3-ton truck, and also has a maximum load capacity of 8,500 pounds. This model is equipped with a 3½-yard power hoist body, and is equipped with a seven speed transmission. The seven speed transmission adapts the truck for steam shovel work, as with this transmission, two ranges of speed are provided, a low range and a high range. This enables the truck to have ample power in pulling out of excavations, and gives it the necessary speed range for travelling on ordinary roads.

All Hug Roadbuilder models are equipped with the Hug Dual Tire Adapter equipment. By using the Hug

Dual Tire Adapter, the center line of the front tire is in alignment with the center of the two rear tires. This alignment makes it possible for the two rear tires to re-level any ruts made by the front tire, thereby reducing subgrade maintenance, and eliminating any excessive subgrade ruts.

Another exclusive Hug feature incorporated on all Hug Roadbuilder models is the Hug Multi-Cushion Relax Spring Drive. This spring design makes it possible to drive through the spring and without injury to the spring. All torque rods are eliminated, the combination side spring acting as a torque rod, and the top half as a semi-elliptic spring. By using this type of spring, all driving forces are cushioned and all direct shocks to rear axles and transmission are eliminated. Another feature incorporated in the Hug Truck is the use of I-beam frames. These frames are all drilled and hot riveted and guaranteed for the life of the truck.

In addition to building a specialized roadbuilder truck, the Hug Company also is in production on three strictly commercial models, and the Hug-Arkansas Truck Co. will also have one of the commercial models on display.

THE PURCHASE PRICE

Since the present road building era began, vast progress has been made in almost every department of highway work. In highway design, in paving, in route planning, sound principles based on wide experience are now generally applied.

There is, however, one important exception to the progress noted; that is in respect to the manner in which purchases are made. Policies governing this detail are still what they were twenty or twenty-five years ago, or more.

In the old days purchasing was mostly a personal proposition, because of lack of any scientific basis of selection. Friendship and family relationship, and, in the absence of these, gratuities of one kind or another, were potent factors in convincing the purchasing official that the products offered were exactly right.

Such practices were not in themselves corrupt but they led to an indifferent use of public money, and they certainly made corruption possible for those who were so inclined. For these reasons a definite procedure was established by law which required that purchase contracts be given to the lowest responsible bidder. This change has admittedly placed purchasing on a much higher plane than ever before and has safe-guarded the people's money against outright plunder. It is now seen, however, that while it closed the door to corruption, it has also closed it to progress.

To the minimum safeguards built by law around public funds the purchasing official is morally obligated to add others which are in the public interest. On account of the trouble involved, however, the busy official has made it a practice of standing on the technicality of the law. The clause "lowest responsible bidder" has come to be a convenient shield against an inconvenient responsibility.

This brings up the question as to what a purchaser has a right to expect for the price paid for any product.

First we have utility, the most obvious qualification, which includes such details as size, capacity, and strength. That there are many degrees of utility, every buyer knows. After utility comes quality, which is an unseen characteristic, including such things as uniformity of texture, dependability of service, and durability. Back of all these comes the character of the manufacturer upon whom dependence must be placed not only for service in supplying the goods when and as needed, but for research and development in the design and use of his goods and for assurances that the unseen qualities are in fact present.

The lowest responsible bid can usually be depended upon only to yield the lowest degree of utility acceptable. It is an unsound basis of purchasing because it encourages competition to produce not goods better suited to a certain purpose, but goods of prescribed qualifications which can be sold at a price low enough to get the award. By discouraging research for the improvement of quality, of methods and of service, it is unfair to the manufacturer and public, alike.

The "lowest responsible bid" tends to establish and perpetuate the "least acceptable utility," and is for that reason an obstacle to the best development of the highway industry. Irresponsible bids should, of course, in no case be considered. Of the others, that bid should be selected which, with due regard to the public welfare and true economy, is in the interest also of substantial progress because of the incentive afforded to improvement of all the factors rightfully covered by the purchase price.

SAFETY ON THE HIGHWAYS

One hundred thousand persons have been killed on the public highways in the last five years, say officials of the American Roadbuilders' Association. Of this number 30,000 were children.

In addition 3,000,000 persons have been injured and there has been \$2,000,000,000 property damage in traffic accidents, it is pointed out.

The majority of the accidents have occurred between the hours of 4:30 and 5:30 in the afternoon, the roadbuilders say, indicating that fatigue is responsible both for carelessness on the part of the driver and foolhardiness on the part of the pedestrian. In the late afternoon when both motorists and pedestrians are homeward bound after a hard day's work bodily discomfort, mental exhaustion and other factors are likely to make for carelessness and lack of attention to hazards that otherwise would be fairly apparent.

The road enthusiasts plan a mammoth safety first drive, to make use of lectures, motion pictures, placards, radio talks and other means of urging care in driving on city streets and country highways. For while accidents are unavoidable, the bulk of them could be prevented if both the driver and pedestrian could be made to think in terms of the other fellow's safety. Safety education is the best means of bringing about this state of mind, highway experts say.—*From Flint Journal.*

Grandma—"Isn't it wonderful how a single policeman can dam the flow of traffic?"

Boy—"Yes, but you should hear the truck drivers."

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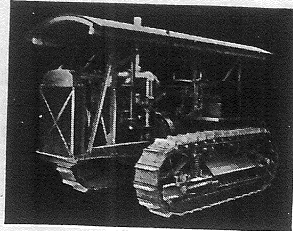
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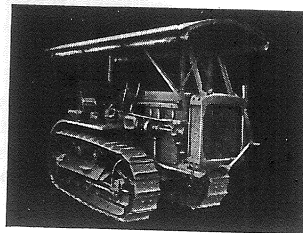
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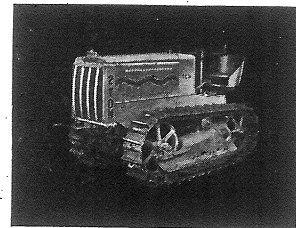
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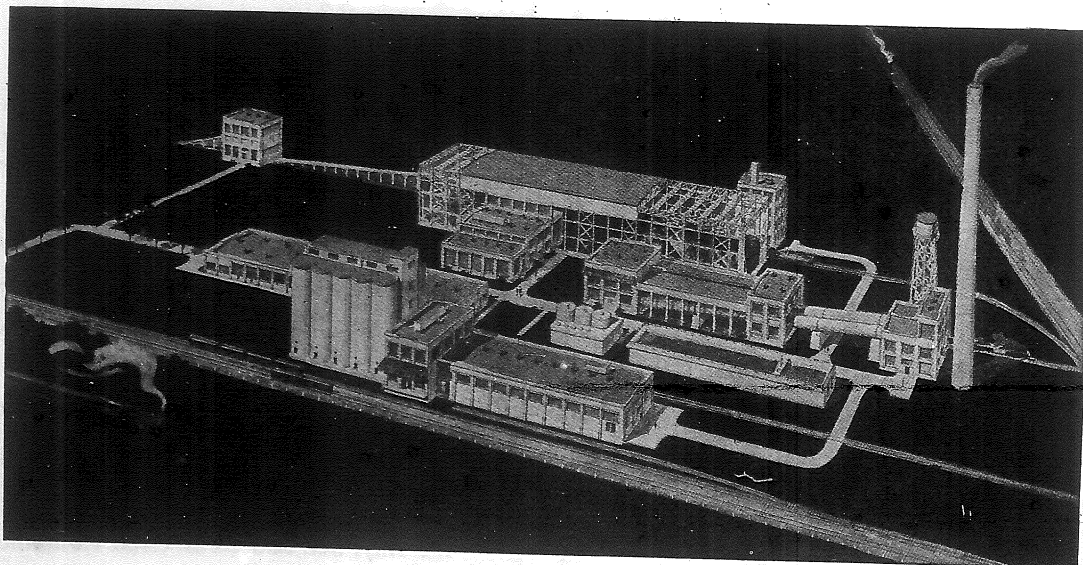


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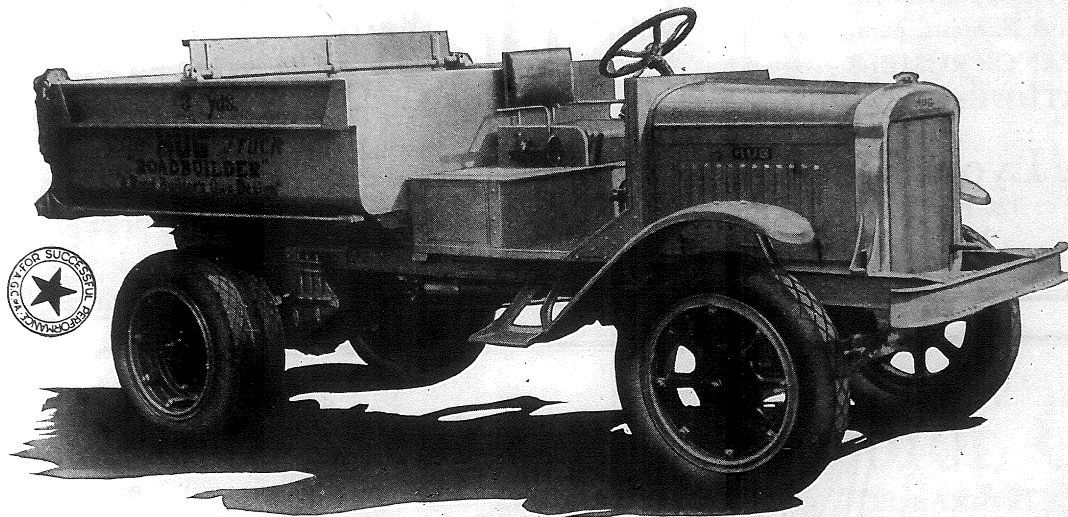
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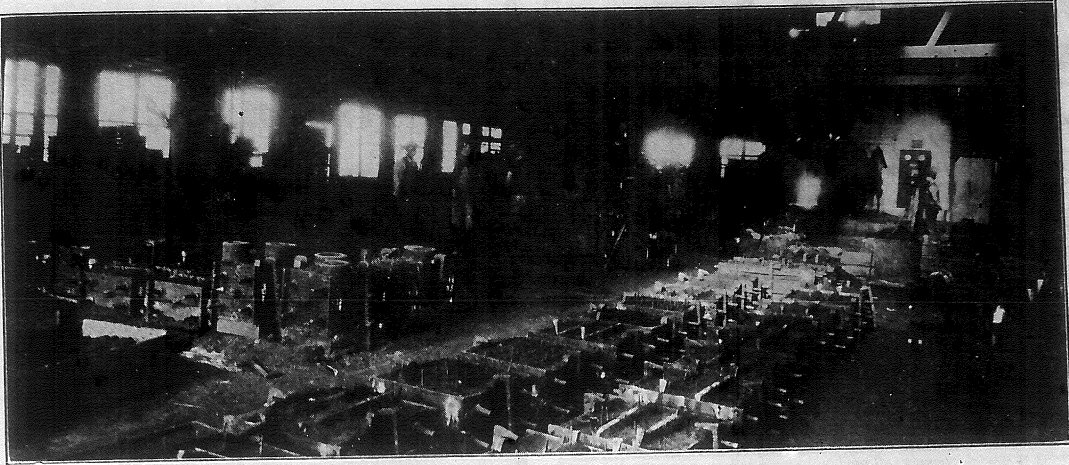
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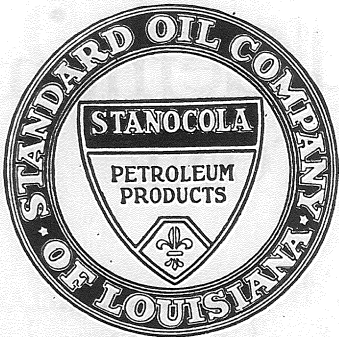


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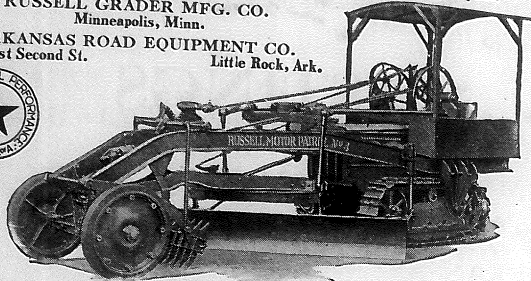
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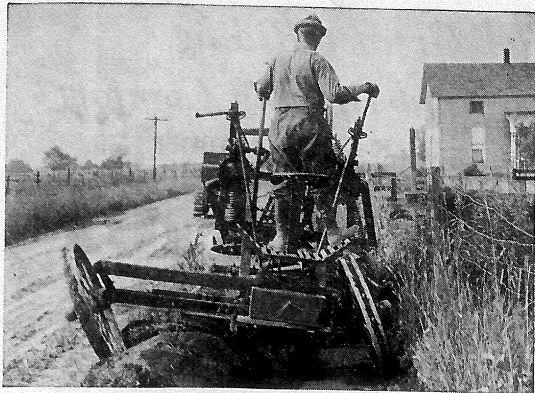
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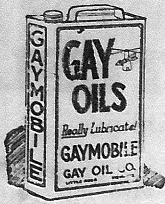
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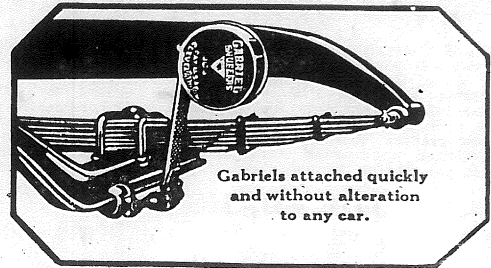
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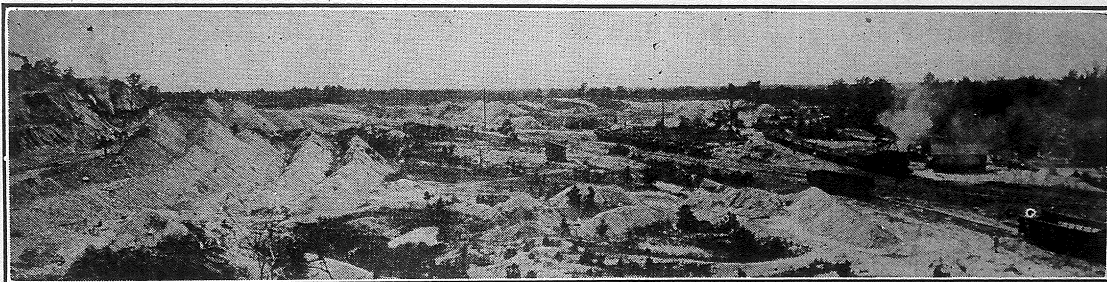
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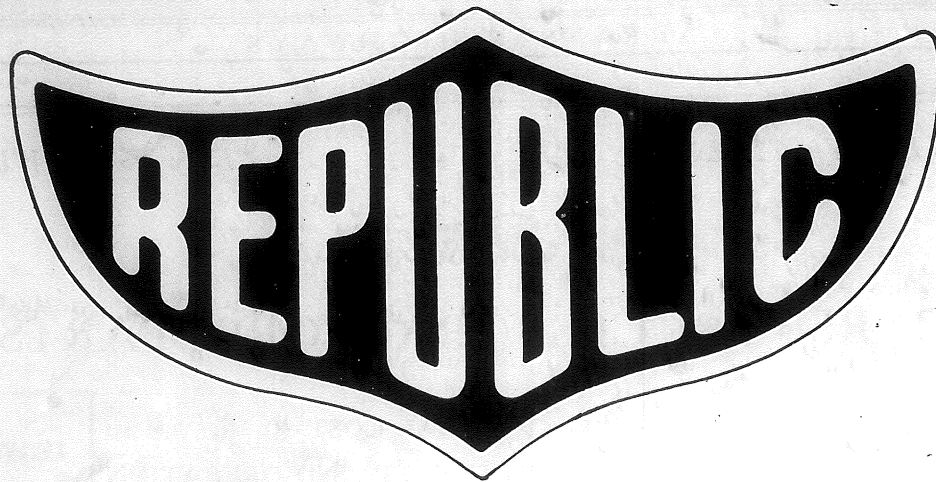
Plant: Benton, Ark.

FOR HIGHWAYS—FOR RAILROAD BALLAST—FOR CONCRETE CONSTRUCTION

Our road clay gravel, weighing 3,000 pounds per yard, is best by every test for road building purposes. Our capacity is from 50 to 60 cars per day, as a result of our separate road gravel loading organization using Bucyrus "70-C" shovels and Baldwin 50-ton locomotives.

Our capacity for washed ballast, washed concrete gravel or washed sand is from 60 to 70 cars per 12-hour shift. Our service to road districts, railroad projects and large construction jobs is of proven dependability.

Call us over Phone 4-3788 or Long Distance 133, Little Rock, or Benton 93, for quick action.



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