

# ARKANSAS HIGHWAYS

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



Vol. 4

MAY • 1927

No. 5

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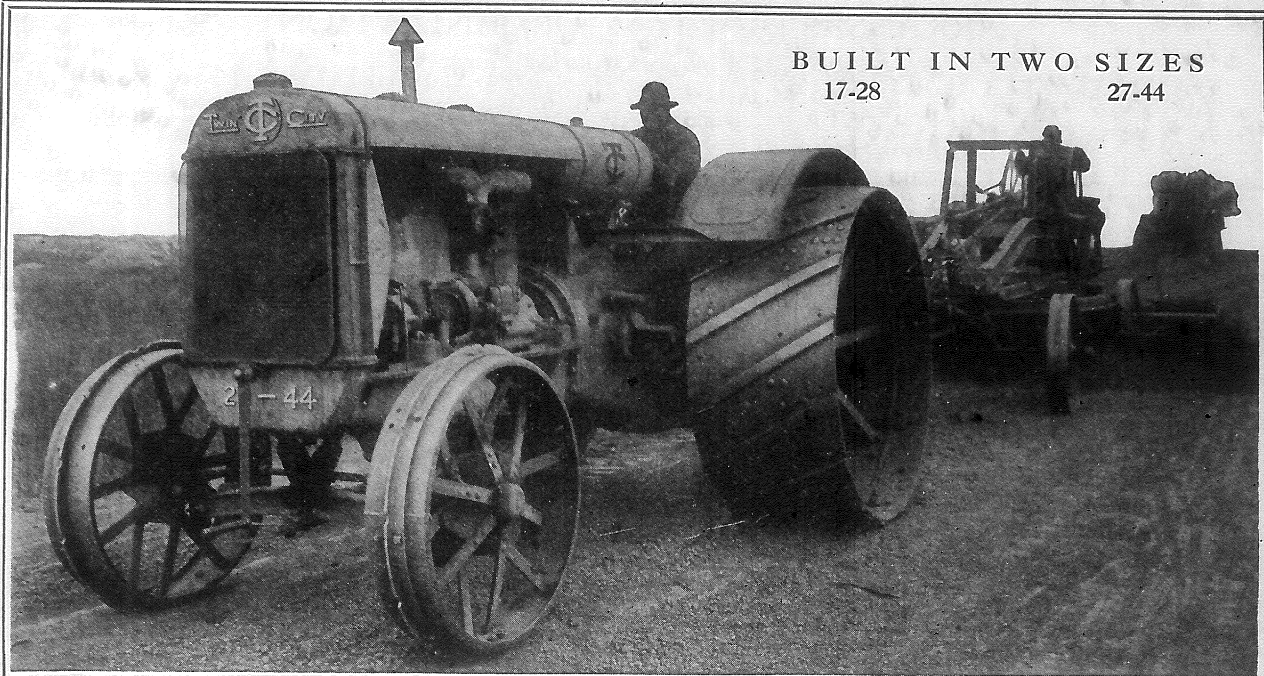
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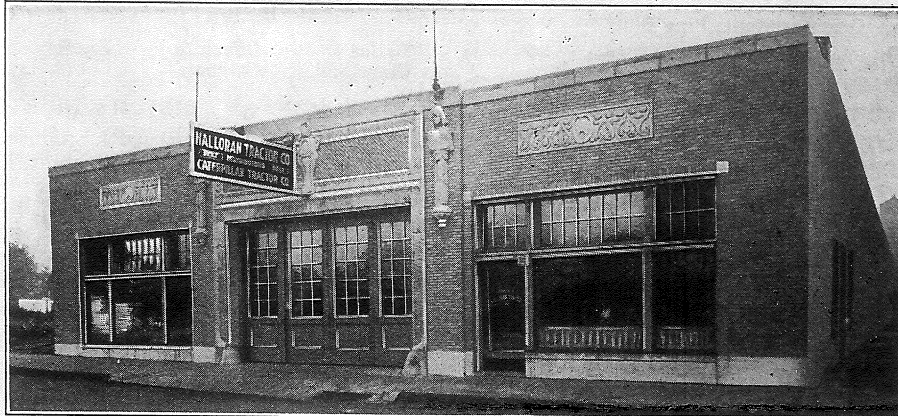
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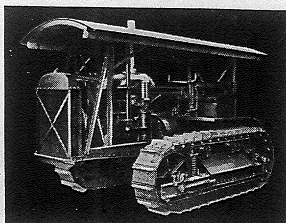
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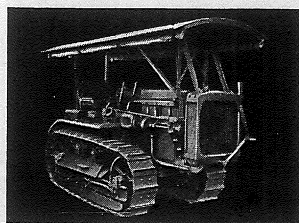
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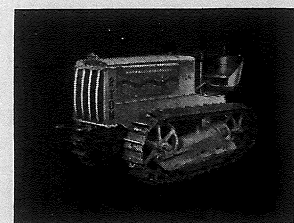
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# ARKANSAS HIGHWAYS

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Magazine



State Highway  
Department

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VOL. IV.

MAY, 1927

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## OUR TASK IS INDEED A BIG ONE

By Dwight H. Blackwood, Highway Commissioner

If the complete check up of damage done to the roads by the floods just now receding reveals the extent of damage over the entire highway system that has been discovered in the partial investigation that I have been able to make, the sum of loss is going to be staggering. I have personally inspected the Little Rock-Hot Springs, Little Rock-Conway, Arkansas-Louisiana, the Dollarway, and other highways, and on these routes found a terrific damage done to both roads and bridges. I believe it is safe to say that 600 bridges have been swept away or damaged to such an extent that new structures will have to be erected. This great loss is distributed over the whole State too. At this time the District Engineers are making a summary of the situation in each of the ten districts, and the huge task of rebuilding roads and bridges is being mapped out from these reports so that a systematic program of restoration may be put into operation.

Such a calamity, of course, was never contemplated when provisions for maintenance were being made in our appropriations. On the contrary, just the bare necessity in the way of money to maintain the roads already constructed and the same meager amount appropriated against the new routes was included in the plans for the building program of 1927-1928. Now, at least seventy-five per cent of the money appropriated for maintenance will probably be consumed in the actual replacements throughout the entire highway system, such as long stretches of road and many complete bridges destroyed. Such an unexpected thing as this will seriously hamper the arrangements we had made for the biennium, but there is nothing else to do but to replace bridges and rebuild roads where the highways have been damaged. In this connection, another handicap arises that will probably inconvenience the public some, a handicap that is absolutely beyond my control, and that is the fact that the money for the actual replacements will not be available until some time

WHILE the damage to the roads is well known to many people so far as their immediate neighborhood or vicinity is concerned, I thought it would possibly be interesting to the State at large to show a few of the several hundred pictures I have taken of the destruction, which in a measure will disclose the many different attacks the water made and the different forms of ruin that the roads have suffered.

DWIGHT H. BLACKWOOD

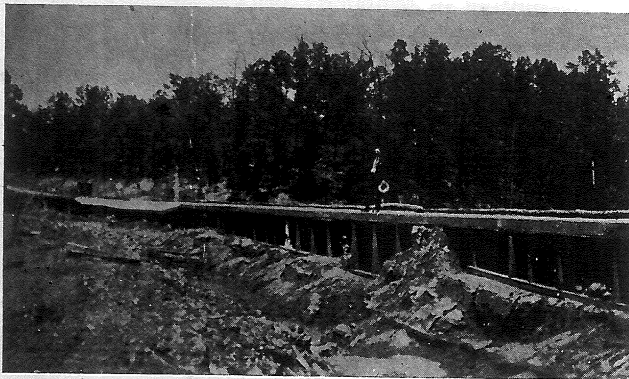
after June 7th, on which date the notes authorized by Legislature will be offered for sale. Unavoidably, these different difficulties are going to strain the patience of us all, but it is hoped that an understanding of the situation will help us to make the best of matters until various obstacles are removed, enabling us to get to work at all the places where work is so badly needed. Even now we are putting in temporary bridges and crossings, in effort to open up the way for traffic. Another thing that holds us back on operations is the condition of the bar pits in most localities. Much water is still standing in these in most sections of the State, and in all places, so far, the mud is too deep to allow machinery and teams to be used. It is hoped that this hold-up will soon be relieved, as many places where roadbeds and bridges have been destroyed could be worked on even now, if it were possible to work around the places requiring replacements.

Out of all the great loss comes one gain, however. It has been said that it is an ill wind that blows nobody some good, and this disaster to our highway systems certainly allows that adage to apply, in that we have been able to study the ravages of water on roads better than any opportunity ever made possible before. Many principles of road building and of engineering precautions have been tried through this flood. Theories that had been doubted are now proven, and the effects of water on roads, and the withstanding of these effects in places, have been demonstrated to people who only had the engineer's word for it heretofore.

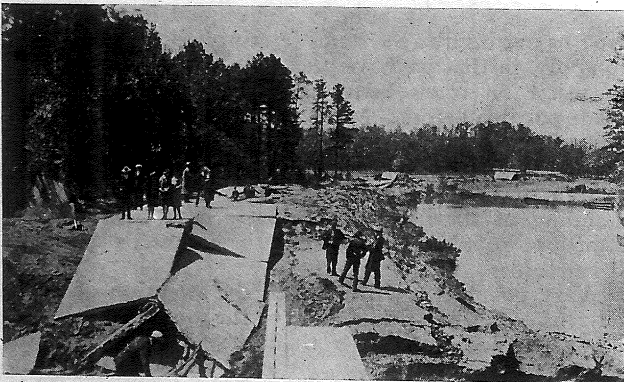
Very possibly it will come to the attention of many citizens of the State that some of the gravel roads withstood the flood far better than the greater number of places where much water pressure was applied to the hard-surfaced structure. I sincerely hope that a widely spread mistaken opinion relative to this point will not result. In the first place, I must say it is true that some

of the gravel road did stand up wonderfully well, emerging from the flood in as good, if not better shape than when covered by water. But this, in the second place, does not prove a more universal fitness of gravel as a medium of road building, for the maintenance of gravel roads under all circumstances will make them too expensive by far to be considered excepting, of course, in places where the traffic demands upon the road are too light to justify even the initial cost of a hard-surfaced outlay. It is during the weather when most travel is possible that gravel roads break down and get in worse shape, for it is while they are dry and heavily traveled that the defects of gravel structures develop. Dry gravel is simply thrown off the road by heavy traffic. This makes for such unreasonable upkeep as developed on the ten-mile stretch of Smackover-El Dorado gravel pike, where during the period of January 1-December 31, 1926, the maintenance cost of that small stretch of road was \$200.00 per day.

Thorough rehabilitation of our roads is promised and this just as quickly as is possible. No delays are created by this department. We are anxiously awaiting conditions that will enable us to reconstruct the highways, as well as to proceed with new projects. Just keep it in mind that "more roads and better roads" is the slogan of my administration, and the utmost effort of every individual connected with the department is hereby, again pledged to that end.



A severe "undermine" which threatens a section of the Little Rock-Hot Springs road.



#### ALUM FORK

The force of water must have indeed been great to "buckle" this long stretch on the Little-Rock-Hot Springs pike.

#### Unhappy F8!

Weep to the tale of Willie T8

Who met a girl whose name was K8.

He courted her at a fearful r8

And begged her soon to become his m8.

"I would if I could," said lovely K8.

"I pity your lonely, unhappy st8.

But alas, alas, you've come too L8,

I'm married already—the mother of 8."

—*Northwestern Life Lines.*



When roads were badly needed leading to Monticello, a refugee "Port," the Tillar-Monticello route was in this condition.



A bridge approach washed out on the Monticello-Tillar road. Practically all bridges suffered like damage.



One of the many places where the hard-surfaced road was not only washed out but washed away. This view on Arkansas-Louisiana Highway.

## The Full Influence Of The Press Is Needed

In these days following the destructive floods that swept through Arkansas and neighboring States, a depression that is only natural abounds. People are literally dazed, and plans for their future are greatly hampered by the view of their destroyed property. In such sad situations the morale of communities is liable to run low, and thereby are created delays in the rebuilding program that everyone ought to take a part in. Determination must be planted in the minds of those who waver, for now is required the full co-operation of everyone; mass thought and mass action is called upon.

The widespread curtailment of agricultural activities creates the worst feature of all, and it will be admitted that the outlook for many individuals is indeed pessimistic. Still, it should be noted that some things that business and banking interests can do for the relief of the farmers and other unfortunates are being done. Arrangements have been made in different communities for the lending of money on an entirely different basis than the usual banking method. Yet the unfortunates need advice, they are needing information, and it rests upon the newspapers to rally to their cause.

The country newspapers today occupy a very enviable position, for it is only with them that free and untrammelled influence of the press remains. For many years there has been observed a rapid decadence of influence of the metropolitan papers. As regrettable as it is, yet true, the editor's opinion of large newspapers, excepting in a few outstanding instances is overshadowed by the business department of such papers. It is not meant that these wonderful papers are altogether subsidized, for such is not the case, but the fact remains that the business end of large newspaper concerns certainly holds up a hand of warning to the editorial department in too many cases. Then, too, the conditions in the country are not as close to heart with the city newspapers, as they are to the country papers.

Those of us who belong to the country newspaper division of the great fraternity of The Fourth Estate, and this writer belongs to that division, ought to be proud of our situation, and should use the influence at our command to the betterment of all conditions.

It is now that the country newspaper can do a wonderful service through its great influence. Find out what arrangements have been made for the relief of those who

need help and tell the people about them through your columns. Where no arrangements are being made, start some through your paper. Call upon the financial and business interests for what you conceive to be the requirements of your community situation, and GET IT. Tell the good people whose hope might be blasted to lift their heads, and guide them as far as you can go, and you will "have served best who serves most."

### O. L. HEMPHILL RESIGNS

O. L. Hemphill has resigned as State Highway Engineer and formed a partnership with Harvey Brown, North Little Rock contractor. The new firm will be known as the Harvey Brown Construction Co. and Mr. Hemphill is vice-president.

Mr. Hemphill's letter of resignation was dated April 25th to become effective April 30. He expressed regret at leaving the department, but said he believed he owed it to himself and family to form a permanent business connection which promises a better future than a salaried position. He offered Commissioner Blackwood the benefit of his experience and knowledge of details concerning highway work at any time he can be of service.

Commissioner Blackwood said Mr. Hemphill accepted the appointment on January 1st with the understanding that he would be permitted to resign if he decided to carry out plans he then contemplated to enter the contracting field.

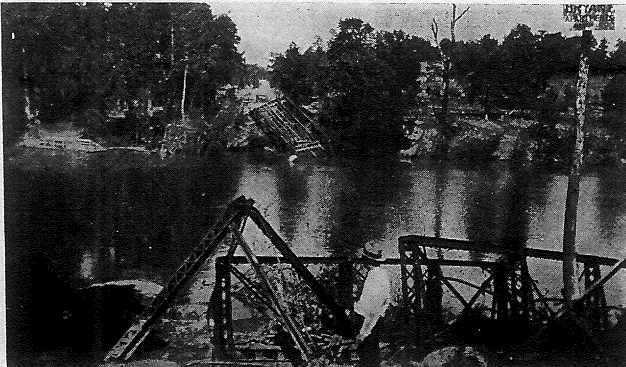
Commissioner Blackwood said the relationship between Mr. Hemphill and himself always has been pleasant and that he was sorry that Mr. Hemphill felt it necessary to leave the department.

### Etymology

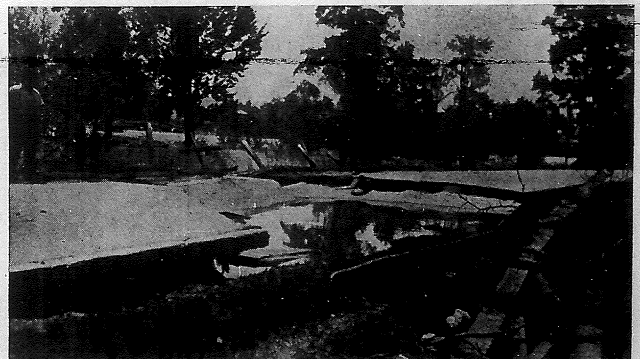
"Matrimony is a serious word," says a domestic science lecturer. Wrong. Matrimony is a sentence.

Matrimony is one of the four words of the English language ending in mony. The other three are parsimony, patrimony and alimony.

Matrimony is derived from the two Greek words, matri and mony. The Volstead act took the rye out of matri, so we have left but the two words, mat and mony. Matrimony after is only the going to the mat each day on the subject of money.



This view on the Hot-Springs-Mt. Ida road shows what happened to many bridges.



Route 65-5-19, south of McGehee, suffered much damage, of which this picture shows one case.

## The Toll Bridge Menace

Free Highway Transportation Endangered by Toll Bridge Privileges Granted At Strategic Points

Covered wagons and covered bridges belonged to the same era, but a purring auto and a toll bridge do not.

Bridges are a necessity. Privately owned bridges, located at strategic points, carrying 30-year franchises, are a private snap. Our much vaunted cry that the highways of the Nation are open and free to everyone is in danger of becoming a misnomer. Modern highway financing presumed that the motor license and gas tax were the only special revenues needed to pay for improved highways, but now we are told that this will not build the necessary bridges and the only way to take care of the situation is to give a long-time, gilt-edge franchise to certain engineering and bonding concerns, who will take these jobs off our hands. We won't need to worry over construction costs, upkeep of bridges or interest items. All the people will need to do is to pay a toll and go on their way rejoicing.

During the Sixty-ninth Congress bills were passed granting franchises for the construction of bridges totaling 163, of this number 53 are franchises to private parties for toll bridges. There was a special rush to get franchises during the last 90 days of the Congress. In that time over 50 per cent of the bills passed were for toll bridges to private parties or corporations.

How many requests for franchises were defeated is still another story.

### A PROMOTERS' GOLD MINE

For several years past the States, in co-operation with the Federal Government, have been busy constructing a system of roads that will connect all the market centers of the country. The work has progressed rapidly and well. This fine network of highways is uniting many communities previously strangers to each other, as their transportation methods used, whether by rail or water, have led into other directions. This system of highways has made evident opportunities for bridge construction heretofore unnoticed.

Parties, either in the capacity of consulting engineers, or bond brokers, have been traveling over the country hunting strategic points where bridges should be constructed and either appearing before the Congress for franchises without local pressure or, as in other cases, securing support of local commercial clubs, etc., on the ground that a bridge at that location will bring more town trade and the community will not be agreeable to a tax levy or bond issue to furnish the finances for the bridge.

In one case recently an engineer even went on the witness stand where some legal difficulties were being ironed out so that two adjoining States could build a free bridge, and endeavored to "queer" matters so that private concerns could secure a toll franchise.

When the State and Federal authorities, who are responsible for the expenditure of public funds, began to protest against this wholesale granting of franchises for toll bridges on too generous terms without any protection to the public in the construction of these bridges, which ultimately must become public property, these exploiters formed a national organization at St. Louis on January 17 last to "protect" their interests.

### TOLL BRIDGES A FINANCIAL SNAP

Toll bridges are not a new thing in highway financing and have always been "a money maker" for the owners.

In a midwestern State efforts have been made by the State officials to purchase certain privately owned toll bridges. An investigation showed that a bridge capitalized for \$50,000 had a net income in 1926 of \$25,910.51; another one capitalized for \$120,000 showed a net profit for the year ending December 31, 1925, of \$53,440.22. Still another one whose capital stock is \$60,000 admitted gross receipts in 1925 of \$38,000.

In a State on the Middle Atlantic Coast the highway department recently expressed a desire to purchase for the public a certain toll bridge. The owners wanted \$85,000 and admitted a net profit last year of 33 per cent on that valuation. The State closed the deal for \$55,000 only because it was in a position to make another interstate road connection with the adjoining State on the interstate system and eliminate this location entirely.

These are a few of many cases scattered throughout the country, showing the big profits made off the general public who yet are compelled to patronize them.

### SOME TOLL BRIDGES NECESSARY

If the public wants bridges faster than a tax levy will construct them, the only other recourse is a bond issue. But why give the job of selling the bonds to private concerns, who, when the State does take over the bridges, are in a position to demand an extra profit. If you *must* have a bridge and it *must* be a toll bridge, let the State make the profit and not a few individuals.

The Legislature of Tennessee recently authorized the issuing of \$5,000,000 in bonds for the State to build toll bridges.

A State-owned toll bridge will become a free bridge much sooner than if it is a privately owned toll bridge. Every toll goes toward the retirement of the bonds and none into the private bank accounts of individuals.

### PRESENT LAW INADEQUATE

The present Federal law controlling the granting of franchises over navigable waters makes no requirement for supervision of the construction of a bridge or the maintenance of a bridge after it is once constructed. The Federal Government grants franchises because it has control of the navigable waters, but it is only interested in the location and plans for the bridge insofar as it may affect interstate commerce.

At no time does the Federal Government contemplate ever purchasing, for Federal ownership, a toll bridge. This is looked upon as a State responsibility. Being a State responsibility, the State should have supervision over the construction and maintenance of a bridge which at some future time is bound to become State property.

### REMEDIAL LEGISLATION ASKED

During the last session of the Congress just closed a bill, sponsored by the American Association of State Highway Officials, was introduced by Representative O. B. Burtness, of North Dakota, which proposes to make certain amendments to the present General Bridge



Act and adds features which will protect the public in the granting of franchises. There was no opportunity to hold hearings on this bill, but it will be reintroduced in the next Congress, and its merits made known to those who are responsible for Federal legislation. The public press is already awake to the situation and large business concerns as well as the traveling public expect to be heard.

#### OUTLINE OF PROPOSED GENERAL BRIDGE ACT

The following is a synopsis of the proposed legislation to control the granting of franchises for free and toll bridges and supervise the construction and maintenance thereof:

##### Section I.

Consent of the Congress is given to erect bridges over navigable streams under the following provisions:

1. Secretary of War must approve location and plans so far as they are affected by navigation.
2. Bridge privately owned on system of State highways shall not be constructed until location, design, plans, contract, etc., are also approved by State Highway Department.
  - (a) If located between two States, both States must approve.
  - (b) If States cannot agree, the Secretary of Agriculture shall make final approval.
3. Erection of privately owned bridges shall be inspected by the State highway departments and maintenance of such bridges shall be subject to inspection and satisfaction of the State highway departments.
4. No tolls can be collected until above provisions are complied with.

##### Section II.

The Secretary of War shall have authority to compel those having supervision of any bridge constructed under this act to revise or make changes to meet navigation conditions.

2. Operation of draw bridges and the maintenance of lights, signals, etc., shall be under regulations prescribed by the Secretary of Commerce.

##### Section III.

1. Toll rates shall be reasonable and when collected for privately owned bridges they shall be limited to yield not to exceed 10 per cent net per annum on the actual cost as determined by the authorities designated in this act.
2. Bridge tolls over bridges wholly within one State shall be controlled by State highway department or other board so designated by State law.
3. Bridge tolls on bridges on State lines shall be regulated by State designated authorities, and in case they do not agree, the tolls shall be fixed by the Secretary of War.

##### Section IV.

1. States or political subdivisions may erect toll bridges under regulations already described, and tolls shall not exceed amount necessary to retire cost funds and maintenance within a period of not to exceed 25 years. After that time such bridges must be free of tolls.

##### Section V.

(a) Secretary of War may give permit for the erection of a toll bridge by private parties when the State highway department of the State affected certifies to him that the State is not in a position to finance such bridge.

(b) Power is given to secure real estate and other property needed for location and construction of bridge under laws of the States concerned.

(c) States or political subdivisions may take over privately owned toll bridges at any time under condemnation proceedings or may take over said bridge ten or more years after completion and compensation therefor shall be limited as follows:

1. Actual cost, less reasonable deduction for depreciation.
2. Actual cost of acquiring interest in real estate.
3. Actual financing and promotion costs not to exceed 10 per cent of cost of construction and real estate acquired.
4. Actual expenditures for necessary betterments and improvements.
- (d) If State takes over toll bridge and charges toll, said tolls shall be limited to funds necessary to provide sinking fund and maintain bridges, but in no case shall this condition prevail beyond 25 years.
- (e) 1. Within 90 days after privately owned toll bridge has been constructed said company shall file complete sworn report of cost of construction with the



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Secretary of Agriculture if the bridge is on State line, otherwise report shall be filed with the State highway department.

2. The Secretary of Agriculture or the State highway department, as the case may be, shall, within one year after company report has been filed, investigate the books of said company, and the findings as to actual cost of construction shall be conclusive, subject only to review in a court of equity for fraud or gross mistake.

(f) The right to sell, assign, transfer or mortgage is granted, except no remuneration shall be received in case of transfer of authorization for the construction of the bridge only.

#### Section VI.

Books of State or corporation operating toll bridges shall be open to inspection by the State highway departments, the Secretary of Agriculture, the Secretary of War, or their accredited representatives.

State highway departments are authorized to prescribe uniform methods of accounting.

#### Section VII.

Penalty for violation of the navigable features of this act.

#### Section VIII.

It shall be necessary for the Secretary of War to grant extension of time if construction of the bridge has not been begun within one year or continue such construction after the expiration of three years.

#### Section IX.

Definitions of terms used in this act.

#### Section X.

This act applies to all bridges proposed for construction over navigable streams and any future reconstruction or alteration on bridges heretofore authorized by the Congress or a State legislature in accordance with this act.

#### Section XI.

This act does not authorize the construction of any bridge between the United States and any foreign country. Such bridge must first receive special congressional approval.

#### Section XII.

Penalty for violation of the general features of this act.

#### Section XIII.

The right to alter, amend or repeal this act is reserved, and the United States incurs no liability for the alteration, amendment, or repeal thereof.

#### Section XIV.

Repeal of act of March 23, 1906.

#### Section XV.

This act shall be cited as the General Bridge Act.

### 160,000 Persons Killed on Highways in 10 Years

The first note in a nation-wide highway safety campaign, was struck at Chicago, January 20th, by Charles M. Upham, Managing Director of the American Road Builders Association. In an address before a convention of the National Crushed Stone Association, Mr. Upham appealed to every man, woman and child in the United States to help make the campaign a success.

According to Mr. Upham, the automobile has taken more than 160,000 lives during the past ten years. In many places the fatalities are increasing faster than the number of automobiles are increasing, he said. During 1926 many metropolitan districts reported an increase of fifteen per cent in the loss of life over that of 1925.

"Final reports will unquestionably show that more than 25,000 persons were killed in automobile accidents during the year ending January 1st, 1927," Mr. Upham declared. "Most of these accidents were avoidable. The mortality can be cut in half within a short period of time if the people of this country will co-operate with the American Road Builders' Association and each other in the campaign we are putting under way this year."

Mr. Upham said that careless and reckless driving and unfit drivers are responsible for the largest number of accidents, while poor lighting, complex traffic regulations, congestion, dangerous grade crossing, sharp curves, narrow bridges and other highway defects are additional hazards.

At the national convention of the American Road Builders' Association, which has just adjourned at Chicago, the problem of fatalities on the public streets and highways was given thorough consideration. It was decided to launch a campaign, the objective of which is the reduction of loss of life on the highways.

"If the Association can cut the loss of life on the highway in half, it will have saved more than 12,000 lives," Mr. Upham concluded. The safety campaign will be divided into three sections—statistical, engineering, and psychological.—*The National Highways.*

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## Road Maintenance Reduces Cost of Operating Motor Vehicles

By N. M. Isabella, Maintenance Engineer, Wisconsin Highway Commission

The big problem of today on our highways is one of transportation. While there are many construction difficulties before us, the biggest problem to solve is one that will provide highway service to meet the growing demands of the motor vehicle. There is practically no product on the market but what is affected in some way by transportation. The cost of everything we eat and wear is governed somewhat by what it costs to move that product from manufacturer or producer to the consumer. One of the big factors that tends to reduce transportation cost is efficient highway maintenance. This can easily be seen when one compares some of the experiences he has had on a well-maintained road and on an uncared-for highway. There is no question but what the cost of operating motor vehicles over a poorly maintained road is much greater than the cost of operating the same vehicle over a highway that is well maintained.

### FACTORS INVOLVED IN MAINTENANCE

The maintenance of a highway is much different than the construction. In the building of a highway, definite factors are considered, such as alignment, grade, drainage structures, thickness and width of surfacing, and other details that vary with the locality. In maintenance the remedy or method applicable to one road does not necessarily apply to another. The problem is to keep the road up to its original condition insofar as funds will permit. The condition of the road varies with the type and character of the traffic, drainage, topography, weather conditions, and thus one cannot definitely say what the maintenance cost of a given road will be because these items cannot always be determined in advance. Efficient road maintenance will, therefore, depend on the following factors:

1. Sufficient funds available.
2. Organization and equipment.
3. Proper planning and budgeting of funds to meet traffic demands.
4. Efficient execution of the work as planned.

### FUNDS AVAILABLE

In order to carry out maintenance work successfully, sufficient funds must be provided. In most of the States, the funds used for maintenance work are derived from revenues collected from motor vehicle fees. The motor owner is becoming more critical each year in his requirements for highway service, and takes the opportunity of informing the highway official that he is paying the bill and desires that he be given just returns for the taxes paid by him.

### ORGANIZATION AND EQUIPMENT

In addition to having sufficient funds to work with, it is very essential that the work be handled by a competent organization supplied with up-to-date equipment to do the required work properly.

### PROPER PLANNING TO MEET TRAFFIC DEMANDS

The future demands of highway traffic must be anticipated from the best available information. Preparations for the year's work should be made well in advance. Probably one of the most undesirable features from the standpoint of the motorist is the closing of the main

highway to traffic and requiring him to travel over a detour. If these are not planned for in advance, there is bound to be dissatisfaction from the motorist's viewpoint. The widening of roads for safety and surface treatments to eliminate the dust nuisance on gravel roads are important factors to consider.

### EFFICIENT EXECUTION OF THE WORK

After having sufficient funds available, the organization and equipment, and definite plans made to take care of traffic, the last item, and one of the most important, is the efficient execution of the work. This item is important because it involves the thought and energy of the men who actually carry out the work as well as the official in charge.

### THE NEED OF ORGANIZATION

In order that a maintenance organization may function efficiently, it must not be tied up in too much departmental red tape. There should be a governing head or body to all successful organizations, but in work which varies as much as the maintenance of a State highway system, the exercising of a certain amount of judgment and discretion must be left with the man actually doing the work and his immediate superiors. The general policies can well be formulated by the governing body, but the matter of details which vary with every locality and with every highway must necessarily be left to the maintenance man who actually carries out the work.

The maintenance work in Wisconsin is carried on somewhat differently than in most of the other States. While the work is under the supervision and direction of the State Highway Department, it is actually done by the county forces and to give the public efficient highway service there must necessarily be very close co-operation between the counties and State. We are glad to say that this co-operation has been existent from the very beginning and has continued with increasing benefits. It has been our aim to plan the work for the succeeding year at the end of the maintenance season, at which time a representative of the State Highway Department, accompanied by the county commissioner and county highway committee, go over all the State trunk highways in the county and determine the improvements to be made under gang maintenance on each highway. The general maintenance work, of course, is routine and the cost consists primarily of patrolmen's salary, supplies, repairs, and extra help.

Gang maintenance work, which may be divided into reconstruction and betterment, requires semi-construction methods and must be planned for in advance. These projects are planned for and a definite amount of money is set up for each project. The county must agree to commence the work on a certain date and have it completed within a certain time. Usually the work is so planned that it will offer the least inconvenience to the traveling public. A good many of the gang maintenance jobs are completed early in the season before the heavy summer traffic starts and some of the work is done in the fall of the year after traffic has decreased considerably. We try to keep the work to a minimum dur-

ing the months of July and August, which are considered the heavy traffic months.

#### *Four General Classes of Work*

**Spring Maintenance.**—Probably the most critical time in the maintenance of earth, gravel and other light surface roads is in the spring of the year when the frost is leaving the ground. It is true that spring conditions do not show their effect so much on a permanent or durable pavement, but when one considers the fact that the hard surface or paved road comprises only a small per centage of the rural highway mileage, the big problem lies in the proper maintenance of the gravel, shale, stone and earth roads. At the beginning of the maintenance season which is usually during the month of April, the ditches must be opened, the culverts cleaned out, the surface graded smooth, and repaired wherever necessary. Objectionable features must be removed from the right-of-way. At this time of the year it is also possible to do the best work in shaping the cross section of the road. The high places may be cut down and the low places filled. If the patrolman gets a good start in the spring, the maintenance of his section will not be a great task during the summer season, but if the important details are neglected during the spring, he is bound to have trouble during the summer months when traffic is at its maximum. It is sometimes impossible for a single patrolman to do all the work necessary on his section in the spring, and if this is true, he should be given extra help and in most instances a tractor-grader outfit should be run over his section to open the ditches. The guard fence, rip rap, etc., should be repaired.

**Summer Maintenance.**—After the details of spring maintenance have been taken care of, the patrolman's time is then required almost constantly on the surface of the road. From time to time, he will find it necessary to replenish the surface materials from the stock piles which have been provided. Where traffic reaches 500 or more vehicles per day on the ordinary dirt or gravel road, the patrolman finds that he must keep his grader constantly on the surface in order to provide a smooth riding road. If, for any reason, he leaves the road a day or two, it is very plainly noticeable. One of the important items during the summer months' work is the cutting of weeds along the shoulders, ditches and right-of-way. In some cases, two cuttings a season are sufficient, but we have found that in many cases it is necessary to cut the weeds and grass as many

as four times. The months of July and August require the most intense maintenance on the surface for during these months the traffic is at its maximum. In Wisconsin it is not expected that the patrolman can do much more than keep the surface in a smooth riding condition during this period. Usually, extra work which is required on his section is taken care of by special crews.

**Fall Maintenance.**—In the fall of the year when traffic has decreased considerably, the patrolman will find more time to take care of work other than the surface. At this time the ditches should be opened again and all culverts cleaned out, and the weeds and brush cut from the right-of-way to prevent snow from drifting on the highway during the winter. Stock piles of materials should be provided at those places where the road is apt to give trouble in the spring. The road surface should be kept smooth so that when heavy frost comes, it will freeze in a uniformly smooth condition. It is very essential that the patrolman continue his grading operations until the ground becomes frozen.

**Winter Maintenance.**—In most States of the latitude of Wisconsin, the amount of winter maintenance done is comparatively small on account of snow conditions. Quite a number of States have adopted systematic snow removal programs and are attempting to give through highway service during the winter months. We believe the time is not far distant when well-formulated programs for winter maintenance and snow removal will be put into practice in all States in the snow belt. The demand for through highway service during winter months is rapidly growing. This is very plainly shown in Wisconsin by comparing the snow removal of last winter with that of this winter. During the season of 1925-1926 there were approximately 1,500 miles on the snow removal program. About \$100,000 was expended. Sixty miles of snow fence was placed. This fall \$250,000 was appropriated for snow removal work, 275 miles of snow fence was placed, and an increased supply of equipment was purchased. The counties are also attempting to keep all the main highways open to traffic. In the northern part of Wisconsin considerable logging is done during the winter and it is necessary to leave about five or six inches of snow for sleighing. This makes snow removal in the northern counties a little more difficult, but they are giving good service to both the sleigh and automobile traffic.

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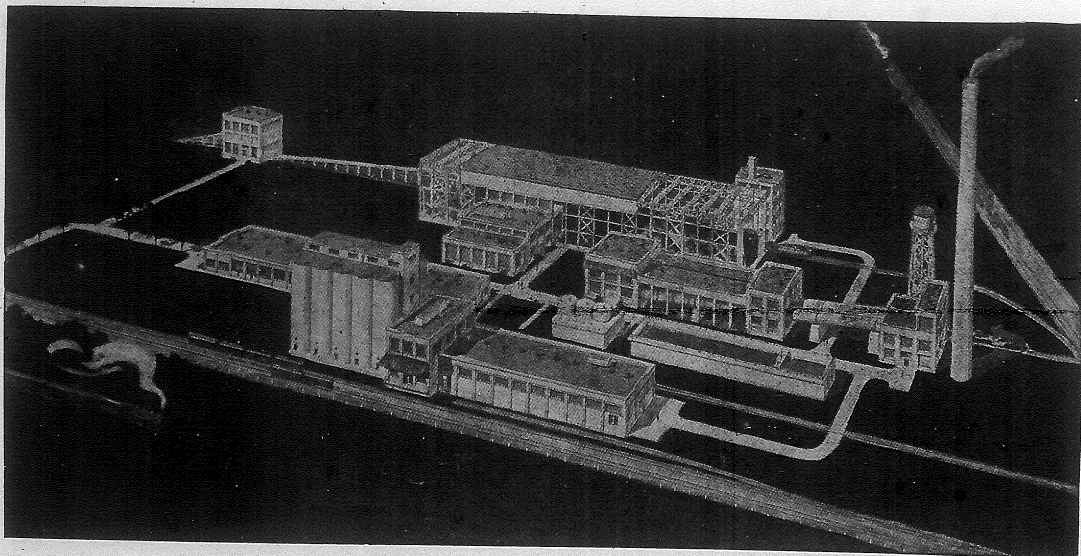
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This is as it should be, of course, for the railroads—the greatest development agency in the Nation—must have an increasing volume of business at a fair rate if they are to continue to grow and develop and expand themselves to be of proper assistance in the growth and development of the Nation.

The railroads west of the Mississippi river, while they have been carrying their full share of the burden, have not been receiving a fair share of the reward. From 1920 to 1926, freight operating revenues on western railroads increased only 3.8 per cent. During the same period, passenger revenues decreased 34.5 per cent.

Constant improvement is being made by the railroads. But if this is to continue, the public must see to it that the carriers receive an adequate rate for adequate and dependable service. This is as much the problem of the public as it is of the railroads. The public must interest itself in these questions with a view to being helpful.

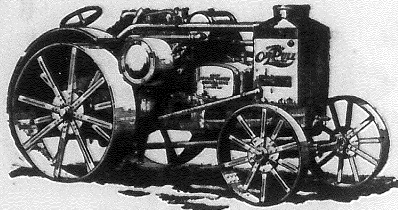
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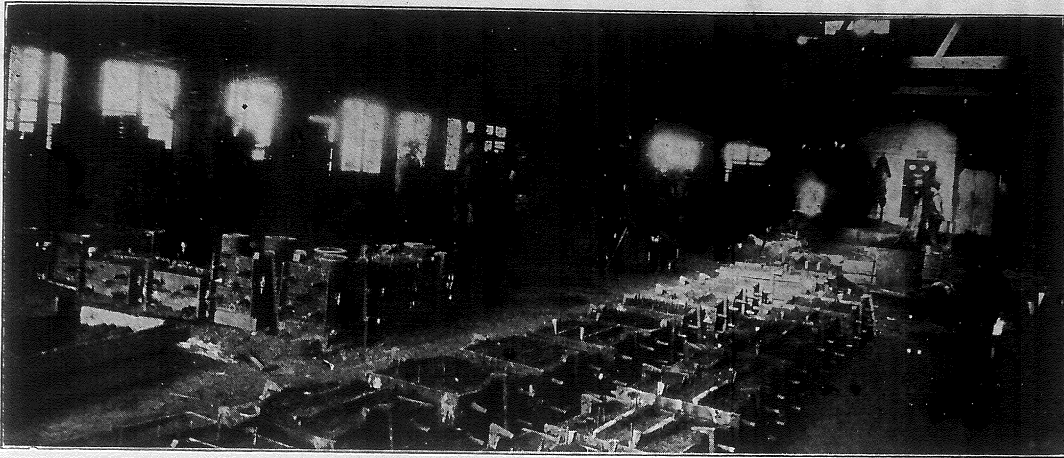


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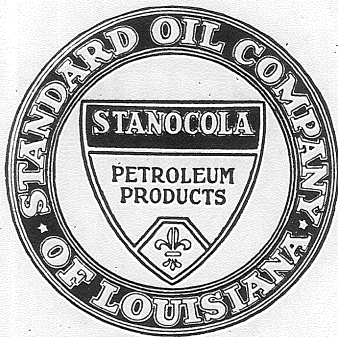


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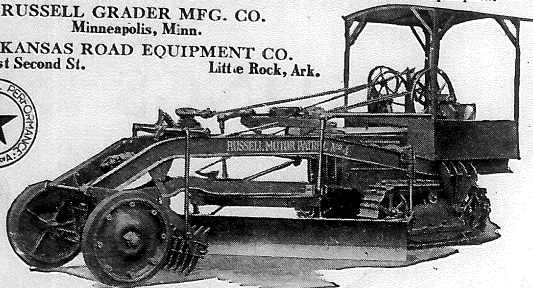
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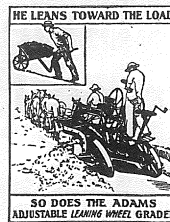
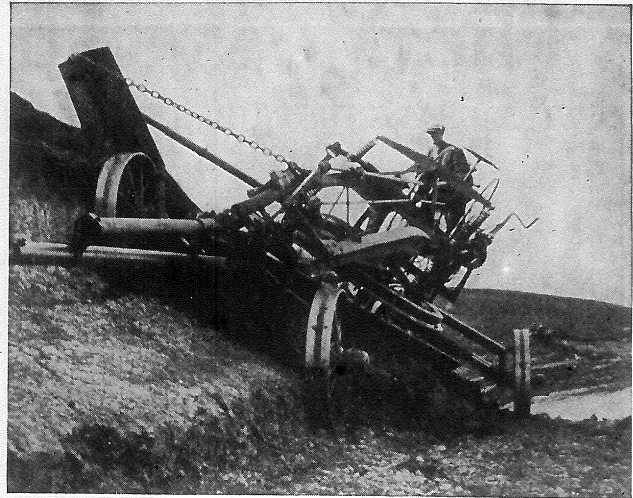
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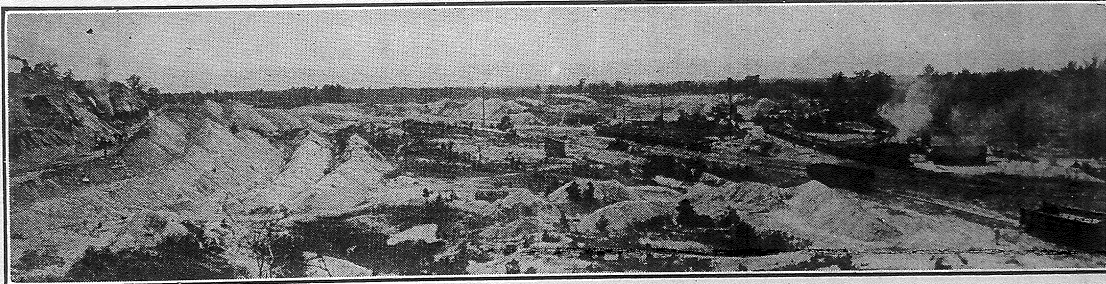
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IRON

**T**HE mechanical advantages of the corrugated type of culvert are thoroughly established. Safety in shipment; ease of handling; a saving of 75 per cent in installation costs; and strength to meet the most severe requirements have been proven by thousands of installations.

Corrosion is the corrugated culvert's worst enemy and now that too, is checked by making the culverts of Toncan Iron.

To iron that has been thoroughly refined is added copper and molybdenum. These two elements alloy with the iron and impart a corrosion resistance that has never been reached before.

Thus Toncan Iron is particularly fitted for the permanence which is so necessary in culverts. Yet Toncan costs no more.

*Let us tell you the complete story about Toncan Iron corrugated culverts.*

**Choctaw Culvert & Machinery Co.**  
Second and Butler  
Memphis, Tennessee