

KANSAS FARMER

For the improvement  of the Farm and Home

Volume 52, Number 50.

TOPEKA, KANSAS, DECEMBER 12, 1914.

Established 1863. \$1 a Year

KANSAS has 108,000 miles of the best natural highways in the world.

These are the roads of the people—everybody uses them.

The farmers of the state haul more than eleven million tons of products a year over them.

They average one trip a week to town and one to church, and one to the neighbor's.

The boys and girls travel them to school five days a week six months of the year.

So these highways are put to some use.

And because they are so much used is the reason they should be better roads.

At present Kansas roads are costing \$5,000,000 a year, one and three-quarters millions of this being spent for grading and dragging.

Only 27,000 miles are dragged. That's a shame!

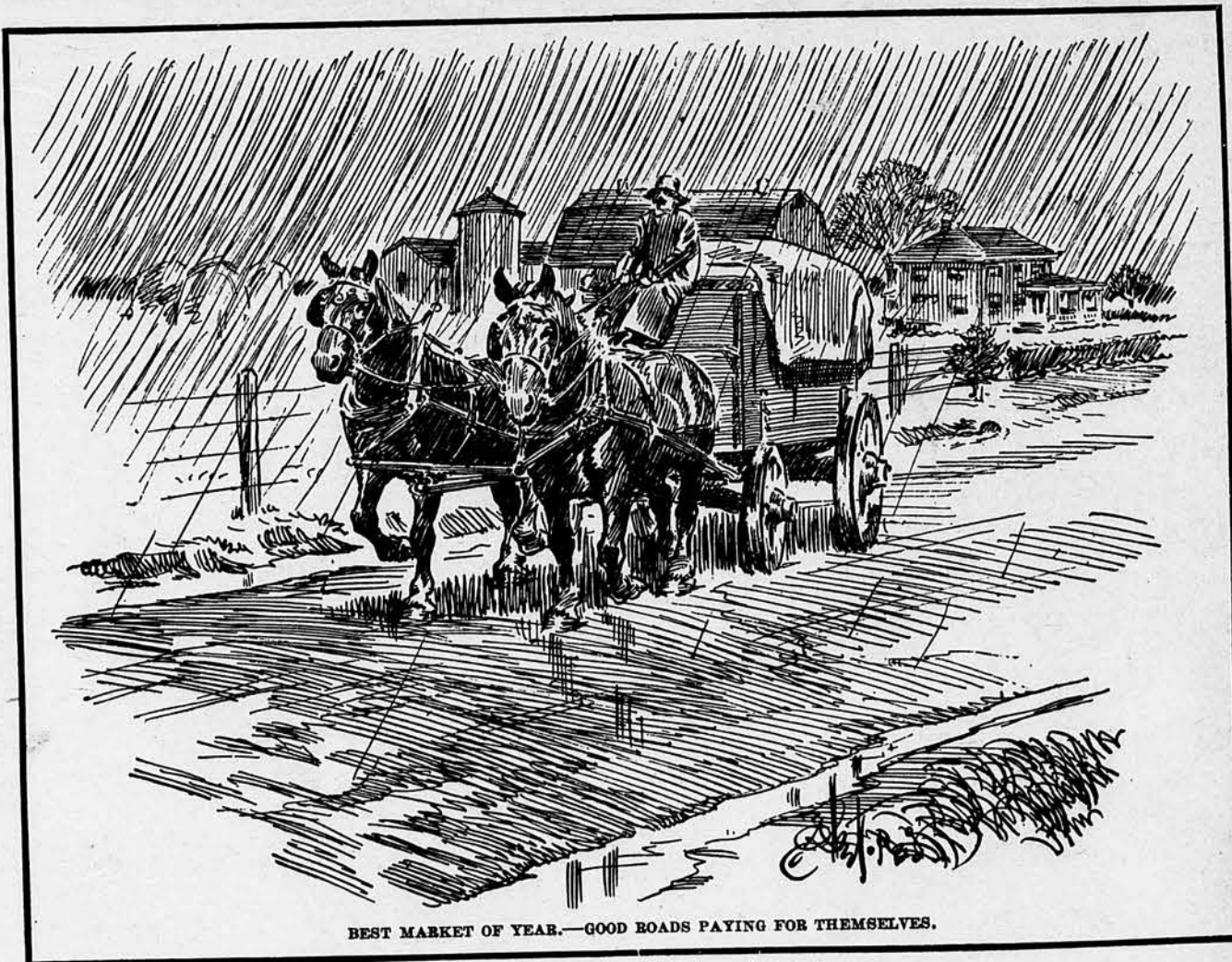
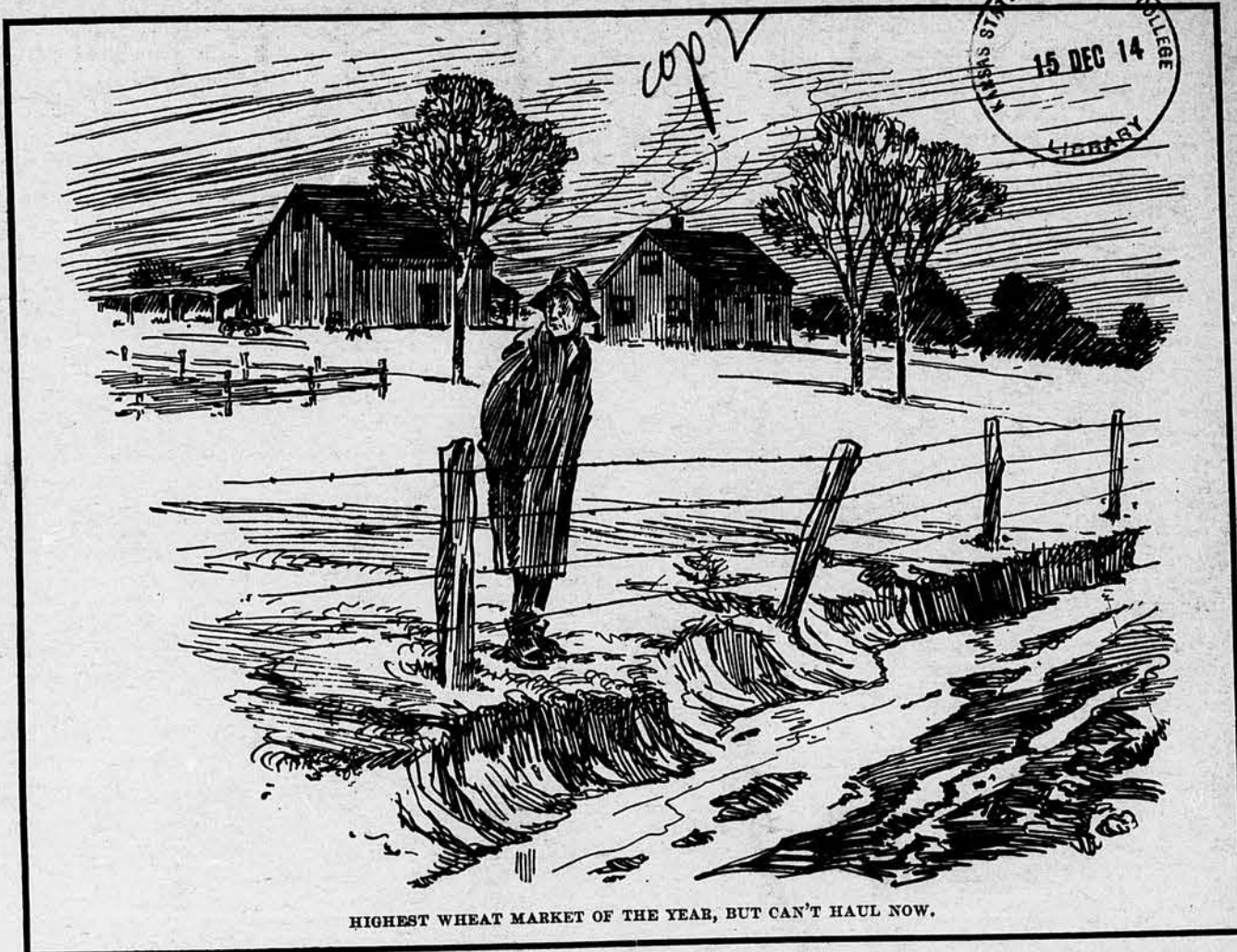
Dragging will do more for good roads than any other one thing.

The worst mile of road, after it's been properly graded, can be kept perfectly dragged for \$15 a year—about \$17 a year is being spent per mile for dragging.

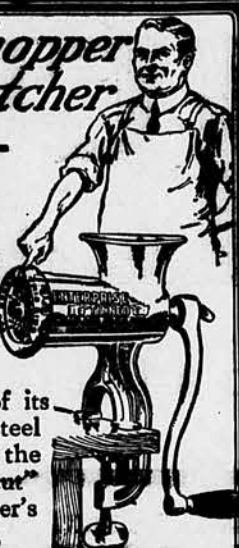
With this expenditure we ought to have more and better dirt roads.

It costs the average Kansas farmer, to haul his crops to market, 25 cents per ton per mile. He can reduce this cost to 15 cents if he only will.

You owe it to yourself and your pocketbook will fatten if you see that the dirt roads of your community are the best possible.



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Good Roads Improve Social Conditions

ROADS should be built for the comforts and pleasures of travel as well as for their pecuniary interests. It has been said that the "pecuniary benefits of good roads sink into insignificance when compared with the social and intellectual advantages." Mankind is a social being and is influenced by surroundings. The maintenance of a seat of learning or of a good church by and in a community has its influence on the people of that community. The maintenance of anything tending toward better living had a good influence. Improved roads have a good influence because they permit an easier intercourse among the members of country communities, and also between rural and urban populations—they effect a unification of the social and commercial interests.

Good roads may not be the whole solution for prosperity and happiness of country life, but they are a part of it—and a very necessary and important part of it. The relation of public roads to the social, intellectual and moral part of life has been largely overlooked. The home, the school and the church is the nucleus around which our social life exists. This is especially true of farm life, where the highway is the means of communication and transportation between the home, school and church. Neglect the public roads and you not only neglect your own transportation facilities but your social and educational environments.

No matter how we may view this development of country life—for the development of country community life, be it transportation, enhancement of property, social or educational betterment—right at the bottom of it all, back of it all and upon which it all is based,

will be found the question of good roads. No proposition for good country conditions is an assured success until good roads are assured. It all rests upon the means of transportation and communication, and the very basis of transportation is the public wagon road.—CURTIS HILL, Missouri Highway Department.

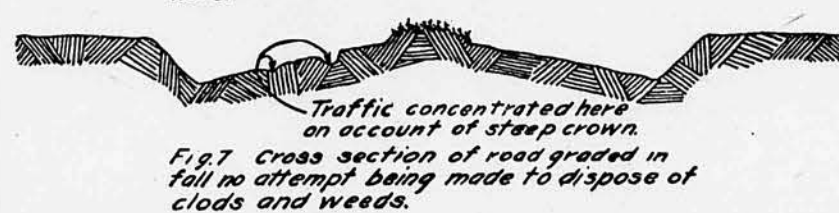
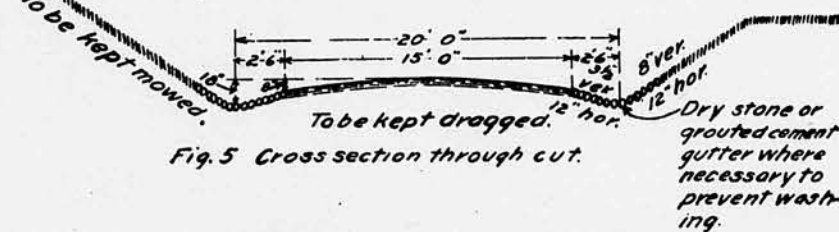
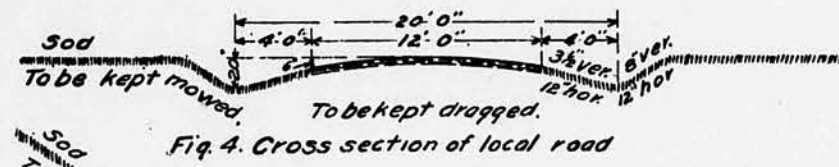
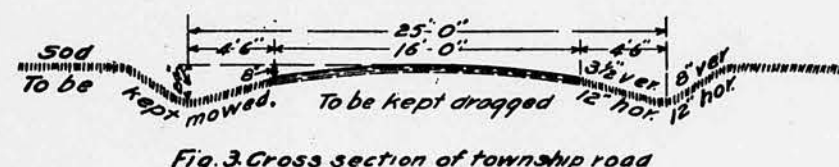
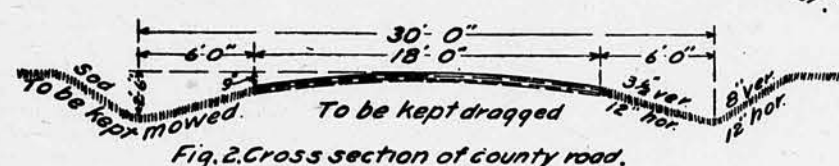
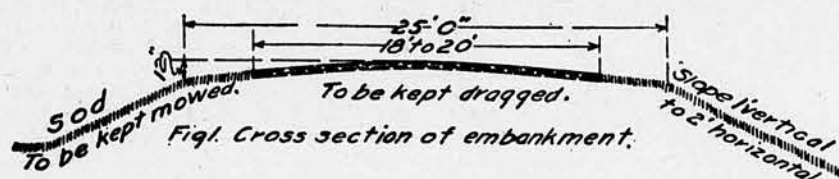
Removing Snow from Roads.

Many miles of dirt road throughout Kansas are kept in perfect condition during the winter by the removal of the snow before it begins to melt. We have in mind one stretch of fifteen miles of dirt road in Shawnee County which was kept like a boulevard all last winter. The same drag used for keeping the road smooth was used in removing the snow. The hitch was made so as to give the drag a greater slope to the outside of the road, the object being to "shunt" the snow to the roadside. One round trip of the drag did the work. After this treatment there was no snow in the track to melt and soften the road surface. This road, of course, had been graded and well drained. The melting snow was all carried off by the roadside ditches. There was not a day during the winter when a horse could not have been driven over this entire stretch of road at a lively trot or a motor car run with great satisfaction.

Were it not for the road enthusiasm being created in the minds of folks who own automobiles, then those driving wagons and buggies would remain in the mud for years to come.

"Repair all small breaks in the surface before winter comes and save the roads."

STUDY IN ROAD BUILDING



THE width, form of crown, side ditches and bank slopes for the different classes of highways shown above are recommended. Drawn by W. S. Gearhart, Highway Engineer, Kansas Agricultural College, for bulletin on "Highway Improvement."



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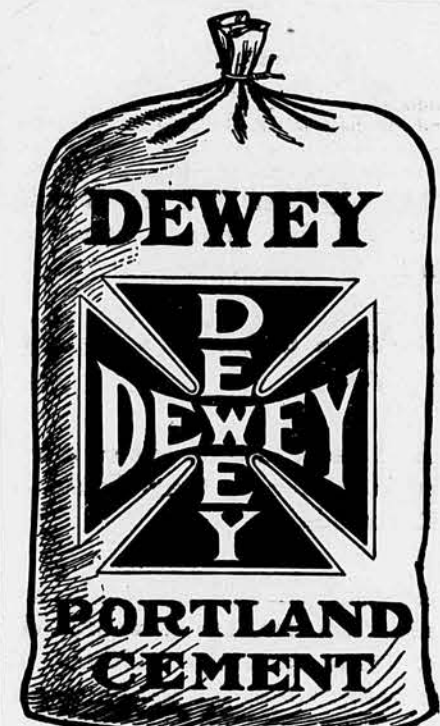
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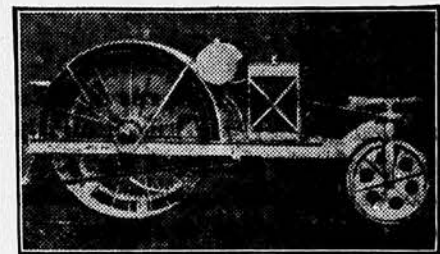
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KANSAS FARMER


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This and That For Good Roads

THAT good highways are important to the financial, social and educational well-being of the community cannot be disputed, and the benefits through these sources cannot be measured in dollars and cents. While a money value cannot be placed on good roads, we are nevertheless inclined to apply the dollar sign to road value in the same way it is applied to general farming operations. Upon the condition of the road depends the cost of delivering farm produce to market and in this respect the monetary standard can be applied. It is well known that the cost of transportation on poor roads is greatly in excess of the cost on good roads. The average cost of hauling farm products over the roads of the United States is 23 cents per ton for each mile hauled. The actual cost varies from 20 to 50 cents on ordinary roads. On well-improved roads the cost varies from 5 to 12 cents. The railroad cost for hauling farm produce is about four-fifths of a cent per ton per mile. In Kansas the average load of farm produce is 2,960 pounds, the average length of haul five and one-half miles, the average time expended in making the round trip for this distance, four and one-half hours, and the cost of driver, team and wagon, \$5.50 per day. From this it may be figured that the average cost of delivering farm produce to market is 21½ cents per ton per mile, or about thirty times as much as by rail. The above figures compared with the average given above for the United States is some evidence that the roads of Kansas are naturally better than the average of the United States. Since there are about eleven million tons of farm products marketed each year over the roads of Kansas, the cost of transportation is about thirteen million dollars. If, through better roads, this cost could be reduced as a result of being able to haul larger loads and to move them more rapidly, to an amount of two cents per ton per mile, which could easily be accomplished, the farmers of Kansas would incur a saving of one and a half million dollars a year. That would be a saving worth while, too. Aside from this is the fact that in every locality in which the roads have been brought to a good state of improvement, land values have increased. Also, there is not a farmer in Kansas who in each five-year period could not have marketed at least one crop to better advantage had the roads been such that he could have moved it rapidly when prices were good. There is much talk about equalizing farm work as between summer and winter. In a considerable portion of the state winter roads are frequently impassable. As it now is, the delivery of grain to market is necessarily crowded into a season of the year when the teams and help are badly needed at other work. Aside from these advantages are those which add to the social affairs of the community, also those which make possible better educational conditions. The average daily attendance upon the public schools in the five states having the best roads is 78 per cent, while in the five states with the poorest roads the attendance is 59 per cent. This presents an angle rarely considered.

It is a fact that the roads of Kansas are the best natural highways in the world. There are numerous contributing conditions which make it easy for Kansas to improve her roads at low cost. There are in Kansas 108,500 miles of public road and on these Kansas is spending each year five million dollars. About 1 per cent, or 1,000 miles of road, has been surfaced with macadam, gravel, oil, brick or concrete. About 25 per cent, or 27,000 miles, is dragged. Of the above annual expenditure on roads about three million is for bridges and culverts, \$300,000 for road machinery, and \$1,700,000 on actually grading and dragging earth roads of which the automobile and motorcycle license tax contributes \$200,000. It will be observed that for every

mile of earth road in the state is expended about \$17. The observing user of roads has noted, though, that only a small road mileage is dragged and since \$15 should keep a mile of dirt road perfectly dragged, it would seem that the available money was not giving the public full value. This is not because the money is not expended but because of a poor system of expending it. We need not increase the available funds to have better roads. Our road improvement methods are becoming better and better each year and it is reasonable to expect much improvement in the near future. We must consider this road question seriously. In the past our roads have not commanded the respect they deserve. The public has been indifferent to road improvement. Our road work of the past has been lacking in interest. But there is evidence of enthusiasm entering into our road building. The numerous road-building jubilees at which county men and city men have met in various localities the past few years is evidence of this. The motor-driven vehicle has done more for the cause of good roads than any other single agency. On the stretches of road improved by or at the insistence of motor car owners, old Dobbin moves a little faster than over the stretches not improved, and one mile of good road begets another mile. Then country folks have noted that roads could be put in condition for motor cars and they have bought cars and good roads work has become catching—like chickenpox. Of the fifty thousand Kansas-owned automobiles, thirty thousand are owned by farmers, and every owner is a good roads booster. With such a representation of boosters as this, extending to every township in Kansas, much can be expected for road improvement. The motor car is no longer for city chaps—it is the countryman's vehicle. So, because it saves time, it widens the horizon of himself and family, it has created a new world for him and with it has come a demand for better roads. Even some bankers no longer oppose the motor car. One told the editor not long ago that the automobile, more than anything else, would make the young folks satisfied with farming and if this country was to continue going forward the boys and girls would have to stay on the farm—and that a motor car would keep them there.

The good dirt road is and always will be the Kansas road, speaking generally, but there are sections of the state in which the hard surface is essential for the main traveled roads and the traveling public of these sections cannot be well served until such roads are built. For such roads, the communities need-

ing them can afford the price, but the building of these is a community or county problem. We have yet to hear of the first community complaining of the cost of a good hard surfaced road. The abutting and near-by farms have in every instance increased in value sufficiently to pay for the road—then each of the other advantages is thrown in for good measure. Kansas has as yet only a few samples of hard surfaced road—totally having about 1,000 miles. This is mostly in the eastern half of the state and apportioned as follows: Seven hundred fifty miles of sand clay road costing \$300 to \$1,500 per mile; twenty miles of oiled earth road, every mile of which is worth the money and costs about 15 cents per square yard; 150 miles of gravel road averaging \$2,500 per mile; 250 miles of macadam costing about \$5,000 per mile; one and a half miles of concrete road costing about \$7,500 per mile; and five miles of brick road costing about \$1.75 per square yard. The cost of the above kinds of road will depend, of course, upon the distance material must be hauled and the width of road, etc. Of the several kinds, concrete is of most recent introduction into the state. In other states it is not new, neither is it new to the cities of Kansas. It has everywhere given a good account of itself. It has a flat crown, making every foot of surface Cement in concrete roads perfectly fulfills its function in highway construction. But dirt roads, as well as other types, require good bridges of steel, stone or concrete, and culverts of steel, concrete or tile. These should be properly built and properly placed. More money has been wasted in building rattletrap bridges and culverts than in any other phase of road construction. Wood has no place in road building. Besides, much money spent in grading has been totally lost in poorly locating bridges and culverts. These are intended to permit free passage of water through the natural courses and when they fail to give the desired outlet they fail in their mission. Bridge engineers have long been considered an essential, but culvert engineers have not been thought of until recently. Herein lies one need for highway engineers in road construction. But the building of good roads of any type is largely an engineering problem. Hence the demand for state and county engineers. Ten Kansas counties have county engineers. Twenty-five others have county surveyors who are qualified to do highway engineering. Thus in this direction we have made a beginning.

The building of modern roads makes



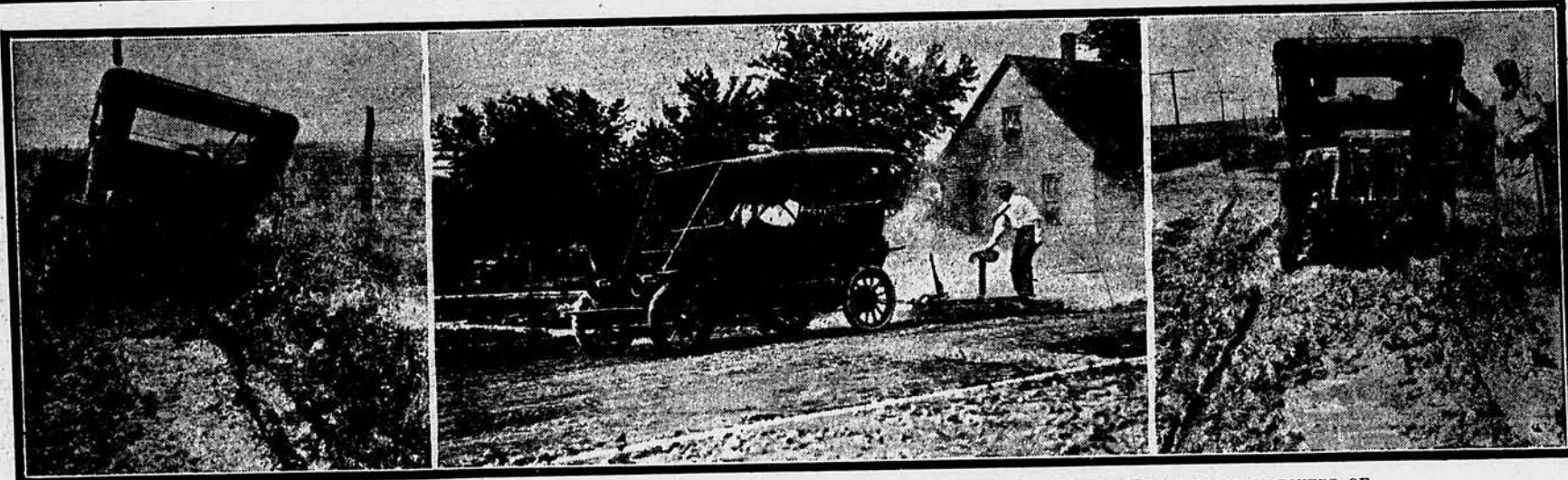
THIS ROAD NEAR CONCORDIA COST THIS FARMER \$1,800.—HE RECEIVED AN OFFER FOR HIS CATTLE BUT THE ROADS WERE IMPASSABLE AND IT WAS SEVERAL DAYS BEFORE HE COULD DRIVE THEM TO TOWN. BY THAT TIME THE MARKET HAD DECLINED \$2.50 PER HUNDRED. ARE YOU PAYING THE SAME SORT OF TRIBUTE TO BAD ROADS?

it necessary that modern equipment be used. Good roads meeting the idea of the present day can not be built economically and satisfactorily by the use of old-style machinery. The day of the cradle is past in road building. The exclusive use of the plow and slip grader is past in road building. The modern road machine with plenty of power to operate it is necessary nowadays to build roads as cheaply and as well as they should be built. The operation of the road machine by horse power is rapidly becoming a thing of the past. This because horse power is not as well adapted as is engine power, and also because owners of good teams do not care to hitch them to graders. The best road work in Kansas is being done by the use of the tractor for power. The tractor used in road work should be equipped with a roller. Tractors are built so that the front wheels may be replaced by a roller. The tractor does its work in so far as power is concerned and at each trip over the road packs the surface. A hard surface following packing is essential to a good road. Some five or six Kansas counties now own tractors. Many other counties hire them. Those counties owning tractors, rollers and road machines keep these outfits busy the entire road-building season. An engineer and a man to operate the grader or road machine require a monthly investment in labor of about \$125 and gasoline costs about \$2 a day. Counties not owning tractors hire these with an engineer at a cost of about \$10 a day. Many counties have successfully constructed good stretches of road by contracting the work to road builders who are on the lookout for such contracts. Of course, not all the grading can be done with a tractor and road machine, but these are the principal implements and those which require the greater investment and which are absolutely essential in the grading of roads which is the first step toward improved earth highways.

The matter of dragging is pretty well discussed on other pages in this issue of KANSAS FARMER. Our present road laws provide for compulsory road dragging and the highway commissioners of each township in the state are required to designate the roads which will be benefited or which can be dragged and it is obligatory for them to arrange to have these roads dragged at such times and upon such terms as they may direct. The amount paid for each mile of road dragged shall not exceed a dollar a mile for each dragging of a road sixteen feet in width, and there shall not be expended more than \$15 per mile per year for dragging. The maximum expenditure is required on only a small mileage of the roads of Kansas and it is believed that an expenditure of five or six dollars a mile for dragging will maintain a large percentage of the state's mileage in as good condition as dragging will afford. Dragging, to be efficient, means careful work—it means the right kind of work at the right time. To be efficient, dragging must not be done when the ground is too wet or too dry. Even at the right time there will be stretches which cannot be treated as they should be and which will deserve special attention. The split log drag is not illustrated in this issue of KANSAS FARMER. This, because its day is largely past; so, because wooden drags are frequently so poorly built as to be inefficient, and second, because they are not adjustable and so fail to meet the varying conditions of the road at dragging time. We have, however, illustrated an adjustable steel drag representing a type of drag which is the most successful implement yet devised for road dragging. The most successful dragging is done by men who have studied the work and these townships frequently let the contract for dragging a specific mileage. So far as the dragging of this mileage is concerned, the man who has the contract therefor is responsible.

WHEN AND HOW OF THE DRAG

Proper Continued Use of Road Drag Will Give Better Roads



DIRT ROAD IN JOHNSON COUNTY BEFORE AND AFTER GRADING.—THIS ROAD WAS JUST AS AGGRAVATING TO THE DRIVERS OF HORSE-DRAWN VEHICLES AS TO THOSE DRIVING MOTOR CARS.—MOTOR CAR OWNERS DO THEIR SHARE OF THE DRAGGING NOW.

WHEN it is realized that of the hundred thousand miles of public roads in Kansas, less than three hundred miles are hard surface—being macadam, brick, concrete or gravel—the importance of some method of effectively maintaining in the best possible condition the large mileage of dirt roads is appreciated. However, a large part of the dirt roads of the state are graded and otherwise improved so that the use of the road drag is effective in maintaining really good roads practically the entire year. The following is a condensed summary of the purpose and use of the road drag as presented in Farmers' Bulletin No. 597 of the Federal Department of Agriculture, the material foreign to Kansas conditions being omitted:

PURPOSE OF THE DRAG.

The drag is a simple and inexpensive device for maintaining certain types of roads which when wet become rutted under traffic and which become firm on drying out. It is also well adapted for producing a smooth and uniform surface on newly constructed roads in which the material used for surfacing is earth, earthy gravel or some similar material. When the construction of the drag is discussed later, however, it will be obvious that it is essentially a maintenance implement and that its use in construction is distinctly secondary. It will also be apparent that roads which are very rocky or very sandy cannot be materially improved by its use.

Properly used at the right time, the road drag performs four distinct offices: First, by moving at an angle to the traveled way it tends to produce or preserve a crowned cross section. Second, if used when the material of the surface is not compact and hard, it tends to reduce ruts and other irregularities in the road by moving material from points which are relatively high to those which are relatively low. Third, when used after a rain it accelerates the drying out of the road by spreading out puddles of water and thus increasing the surfaces exposed to evaporation. Fourth, if the surface material is in a slightly plastic state, dragging smears over and partially seals the so-called pores which naturally occur in earthy material, and thus makes the road surface more or less impervious to water. The advantage of this smearing action of the drag will be more readily understood if a sample of ordinary earth is examined under a magnifying glass. Such an examination will show that the earth closely resembles a sponge or honeycomb in structure, and the desirability of closing the open pores will be readily apparent.

If used improperly or at the wrong time, the drag may do actual injury to the road. Dragging a very dry road, for example, serves to increase the quantity of dust, and may do additional damage by destroying the seal produced during previous dragging. If, on the other hand, the road is very wet and muddy, the irregularities in the surface are likely to be increased rather than diminished by dragging.

HOW TO USE THE DRAG.

The principal factor in successfully operating a properly constructed road drag, provided that the condition of the road is favorable, is skill on the part of the operator. Such skill can be obtained only by intelligent experience in the use of the drag, and no rules can be laid

down which would enable an inexperienced operator to produce first-class results. The following suggestions are intended, therefore, to serve rather as a guide to the judgment than as a criterion to be implicitly followed:

Under ordinary circumstances the position of the hitching link on the draw chain should be such that the runners will make an angle of about 60 degrees to 75 degrees with the center line of the road, or in other words, a skew angle of from 15 degrees to 30 degrees. It is apparent that by shifting the position of the hitching link the angle of skew may be increased or diminished as the conditions require. When dragging immediately over ruts or down the center of the road after the sides have been dragged, it is usually preferable to have the hitching link at the center of the chain and to run the drag without skew. When the principal purpose of the dragging is to increase the crown of the road the drag should be sufficiently skewed to discharge all material as rapidly as it is collected on the runners. On the other hand, if depressions occur in the road surface the skew may perhaps be advantageously reduced to a minimum, thus enabling the operator to deposit the material which collects in front of the runners at such points as he desires by lifting or otherwise manipulating the drag. Many other examples of conditions which require modifications of the angle of skew might easily be cited, but these will readily suggest themselves to an intelligent operator as his experience increases.

The length of hitch is another very important consideration in operating a road drag. In the designs which have been discussed the draw chain may be readily taken up or let out at either end and the length of hitch thus increased or diminished as desired. It is impracticable to prescribe even an approximate rule for fixing the length of hitch, because it is materially affected by the height of the team and the arrangement of the harness, as well as by the condition of the road surface. Experience will soon teach the operator, however, when to shorten the hitch in order to lessen the amount of cutting done by the front runner and when to lengthen it in order to produce the opposite effect.

When the road surface is sufficiently hard or the amount of material which it is desired to have the drag move is sufficient to warrant the operator standing

upon the drag while it is in operation, he can greatly facilitate its work by shifting his weight at proper times. For example, if it is desired to have the drag discharge more rapidly, the operator should move toward the discharge end of the runners. This will cause the ditch end of the runners to swing forward and thus increase the skew angle of the drag. The operator may, of course, produce the opposite effect by moving his weight in the opposite direction. In the same way, he can partially control the amount of cutting which the drag does by shifting his weight backward or forward, as the case may be.

An intelligent and interested operator will soon learn many simple ways by means of which he can easily control the different features of the work which a drag performs, and he will also learn to utilize effectively every effort which his team exerts. Unskilled or indifferent operators, on the other hand, may do actual injury to a road by dragging it in an improper way, and they generally waste a large part of the work which their teams perform. Cases are not infrequently observed in which no care whatever is exercised to see that the team is properly hitched to the drag or to determine when the operator should ride and when walk. Very often the operator seems to think that the drag is, or at least ought to be, an automatic device, and that his function is merely to drive and ride. It is almost needless to say that under such conditions as these the road drag usually proves a failure.

WHEN TO USE THE DRAG.

It is fully as important that a road be dragged at the right time as it is that the dragging be properly done. Furthermore, the difficulties involved in prescribing definite rules for determining when dragging should be done are equally as great as those already encountered in attempting to define how it should be done. Only very general statements concerning this feature of the work can properly be made here, and much must be left to the experienced judgment of those who decide when the dragging of any particular road is to be started and when it is to be stopped.

The rule, frequently cited, that all earth roads should be dragged immediately after every rain, is in many cases entirely impracticable, and is also very misleading because of the conditions which it fails to contemplate. It is true

that there are many road surfaces composed of earth or earthy material which do not become very muddy under traffic, even during long rainy seasons, and since such surfaces usually tend to harden very rapidly as soon as the weather clears up, it may be desirable to drag roads of this kind immediately after a rain. Such roads, however, would not ordinarily need to be dragged after every rain, because of the strong tendency that they naturally possess of holding their shape. On the other hand, many varieties of clay and soil tend to become very muddy under only light traffic after very moderate rains, and it is evident that roads constructed of such materials could not always be successfully dragged immediately after a rain. Sometimes, in fact, it may be necessary to wait until several consecutive clear days have elapsed after a long rainy spell before the road is sufficiently dried out to keep ruts from forming almost as rapidly as they can be filled by dragging. In many cases of this kind, however, it is possible greatly to improve the power of the road to resist the destructive action of traffic during rainy seasons by repeatedly dragging it at the proper time.

Well-constructed sand-clay and topsoil roads should not often become muddy after they are once well compacted. They may become seriously rutted, however, under heavy traffic during rainy weather, and are almost sure to need dragging several times each year. Such roads should ordinarily be dragged as soon after a rain as practicable, as otherwise the surface soon becomes dry and hard, so that it is necessary to do considerably more dragging in order to fill the ruts. Furthermore, the material which the drag moves will not compact readily unless it contains a considerable amount of moisture.

Gravel roads can be effectively maintained with a road drag only when the gravel composing the surface is fine-grained and contains a considerable quantity of clay or earth. Gravel road surfaces in which this condition prevails not infrequently get badly out of shape during wet weather and may sometimes require considerably more attention than well-constructed sand-clay or topsoil roads. The time for dragging gravel roads is unquestionably when they are wet. In fact, the best results are sometimes obtained by doing the dragging after the road has become thoroughly soaked and while it is still raining.

The road drag is the simplest and least expensive contrivance yet devised for maintaining roads constructed of earth or earthy material. The successful operation of a road drag depends to a very great extent on the skill and intelligence of the operator. The time to use the drag is when the material composing the road surface is sufficiently moist to compact readily under traffic after it has been moved by the drag and does not contain sufficient moisture for the traffic following the drag to produce mud. Dragging cannot usually be so arranged as to keep teams employed all the time, and it is, therefore, desirable to have it done by interested persons who can find employment for themselves and teams when they are not engaged in dragging.

"To improve the highways is to provide a means for the salvation of the people."



BUILDING FOR THE AGES.—A SPLENDID TYPE OF CONCRETE BRIDGE, HILL CITY, KANSAS.—BUILT BY GRAHAM COUNTY ACROSS NORTH FORK OF SOLOMON, AT COST OF ABOUT \$4,000.

BUILD AROUND THE HILLS

Consider Topography, Natural Drainage and Material in Road Location



ONE-HALF MILE DIRT ROAD UNDER PROCESS OF CONSTRUCTION WITH TEN-TON GASOLINE ROLLER AND ROAD GRADER.—THE FINISHED ROAD IS TWENTY-FOUR FEET WIDE AND IS MAINTAINED IN GOOD CONDITION THE YEAR AROUND.—IT COST ONE HUNDRED DOLLARS PER MILE TO GRADE THIS ROAD.—SHAWNEE COUNTY PAYS SEVENTY-FIVE DOLLARS A MONTH TO THE MAN WHO RUNS THE GRADER AND FIFTY DOLLARS A MONTH TO THE ENGINEER, AND THESE MEN AND THE OUTFIT SHOWN IN THE PICTURE ARE WORKED THE ENTIRE GRADING SEASON.

IN this prairie country, where the section line is considered as sacred as the family Bible, it requires more than ordinary persuasion to convince the average board of viewers that there are other factors entering into the problem of locating a road than the particular section or property line in question. Our state law makes the section line a public road whenever it has been properly laid out, and, since most of these roads have been opened, this problem is largely one of relocating short sections where a bad grade or hill can be avoided, or where a stream crossing is bad, or where the drainage is poor, or where there are stretches of deep sand.

PRESENT METHOD OF LAYING OUT ROADS.

The method of procedure in the laying out of a road under Kansas laws is by appointing viewers, who by eye pick out a location, or perhaps, after partial trial with the vertical circle on a surveyor's transit, determine the alignment of a road that is to stand for generations and be subjected to constant travel and wear. There is need of preliminary surveys and great care in locating every road. The final location should only be made after careful investigation and study. Any road improvement worth while is expensive; and the expenditure of money for drainage or surfacing but tends to cause hesitation on the part of authorities and taxpayers to the adoption of a new location and construction that will lead to the abandonment of results that may have been secured at a reasonable expenditure of public funds, and thus hinder the adoption of a new location that will be necessary to secure the best road obtainable. The plan too often followed is to reach the top of a ridge by the shortest direct line which is up a point, thence along the top of the ridge. On this location the side cutting is a minimum and the location the one requiring the least movement of material, but without any consideration for future utility or serviceability, nor for the economical conveyance of loads, nor for the comforts of travel. Along these faulty locations farm houses, barns and other improvements are made, and, having been made, the owners most naturally object strenuously to a relocation that will leave their building without direct access to the public highway or interfere with their existing conveniences, arrangement of fields or other enclosures.

In the construction of a new road and the realignment of an old one there is no part of the work, in most cases, that can be made so permanent as the location. The section line may be the proper place for the road; but because it is one mile from a parallel section or property line, this is no evidence that it is the most economical and satisfactory location.

DIAGONAL ROADS.

In Western Kansas, where the land has not been closely fenced, the roads are on the shortest line between two places, but these roads are rapidly disappearing to make way for the section or property-line roads. This policy is a short-sighted one, in which the interest of the public is being sacrificed to the interest of the individuals.

A sixty-foot road on two sides of a section of land occupies 14.55 acres, while a road sixty feet wide in a diagonal direction through the section occupies 10.28 acres of land. Thus there is a saving in the diagonal road of 4.27 acres and 0.587 mile if distance. The

W. S. GEARHART, State Highway Engineer. K. S. A. C.

saving in the cost of right of way, assuming that the land along that section is as valuable as on the diagonal line, is \$85.40 if the land is worth only \$20 an acre. This amount in most cases would be sufficient to grade the 1.413 miles of diagonal line in first-class condition. If a man lives four miles north and four miles east of his market-place he is 5.657 miles on the diagonal line from it; that is, on the section-line road he must travel 4.686 miles farther in making the round trip than on the diagonal line.

NATURAL ROAD LOCATIONS.

If the best roads are to be had, the general topography, natural drainage and road material of the country must be considered, and due regard for the contours gives a winding road. Graceful and natural curves, conforming to the lay of the land, add beauty to the landscape besides enhancing the value of the property, and they are a treat to the traveler after "tacking" for miles on the rectangular zigzag roads.

A common error in the laying out of roads is made in endeavoring to secure routes covering the shortest distance between fixed points. For this purpose the road is often made to go over a hill instead of around it. To illustrate the folly of this practice, it will be observed that the bail of a bucket is no longer when held in a vertical position than in a horizontal; thus the road half way around the hill or the valley is sometimes no longer than the road over the hill or through the valley.

Straight roads are the proper kind to have, but in hilly countries their straightness should always be sacrificed to obtain a level grade, in order to better accommodate the people who use them.

KANSAS GRADES EXCESSIVE.

Kansas has a greater number of roads having much steeper grades than are found in some of the mountainous countries of Europe. It is very hard indeed to justify this large number of miles of steep, hilly road in a level prairie state like this.

The bicycle craze, so called, did more to stimulate road building and especially to arouse interest in the minds of the people in the improvement of grades

than anything else in the history of our country until the advent of the automobile.

The uncomplaining, patient dumb brutes toiled and panted, tugged and wore out their tired muscles to drag loads up steep grades and through quagmires, unappreciated and uncared for as to their comfort and well-being, so far as the majority of the unthinking drivers were concerned.

When men and women, however, started out to supply their own motive power they realized the need of improvement and insisted on more rational and businesslike treatment of the question of proper location of roads.

EXAMPLES OF BAD ROAD LOCATIONS.

In 1905 a 72-foot steel bridge and a stone abutment twenty-five feet high under one end and steel tubes under the other was constructed on a section line in an eastern county in Kansas. The sum of \$200 was spent in building an approach at one end of the bridge, and \$700 cutting down the hill on the other side, and then the work was abandoned. It will require an additional expenditure of \$3,000 for earth and rock excavation to obtain a 13 per cent grade, or a thirteen-foot rise in a hundred feet. This section line road and the bridge have been used only by an occasional pedestrian and dogs. By placing the bridge 225 feet to the east a good crossing could have been had and the road would have followed the old natural road, and with a small expenditure to cut down two short hills a first-class road with not to exceed a 6 per cent grade could have been obtained.

About four miles from this bridge another sixty-foot section-line steel bridge was built in 1908 against the side of a rock bluff. The east approach has never been made, and on the west end at 130 feet from the end of the bridge the rock bluff is forty-two feet above the bridge floor. At the time the bridge was built probably \$150 was spent in trying to make an approach, and the work was then abandoned, for the only practical way to get a good road on the section line at this point would be to construct a tunnel. By moving the bridge 120

feet to the old ford a good crossing could be had and a water grade around the bluff without any changes in the present road. The distance around the bluff is but very little farther than over it. It is needless to say this bridge has never been used.

The county commissioner who is responsible for the location of these bridges is reported to have said, when placing them, "Hew to the line is the way we do it now."

In North Central Kansas a mile of road is now being opened by order of the county commissioners, and even though the surrounding country is a rolling prairie, it would be hard to find a more scenic road in a mountainous country than this will be when completed. It is a section-line road and crosses the same stream three times in the one mile. By opening a north and south road one and one-half miles long and crossing the stream once two bridges could have been eliminated and a very much better road obtained and the general public benefited. More than \$3,000 worth of steel bridges were bought and it will cost not less than about \$2,500 for the abutments to set these three structures on, and an expenditure of \$2,500 for grading will be necessary to make the road passable, or a total of about \$8,000 to accommodate four men whose property is reported as probably not being worth as much as the cost of the road.

This is a case where it would no doubt have been a good investment for the taxpayers to have bought the land and rented it for pasture rather than fasten upon themselves the constant maintenance cost of these bridges and the road. Such expenditures of public funds cannot be too severely condemned.

HOW TO OBTAIN THE BEST LOCATION.

The most economical road location obtains when the sum of the transportation cost plus the maintenance cost plus the interest on the investment equals the minimum.

Errors and permanent blunders may creep in and forever fasten themselves upon the road and its users. Worst of all, these errors become more expensive with increased traffic and are hard to change.

Each problem requires keen insight and judgment. The very best engineer obtainable should be employed to approve the location of all roads.

All European countries and many of the states require that the location be approved by the state engineer.

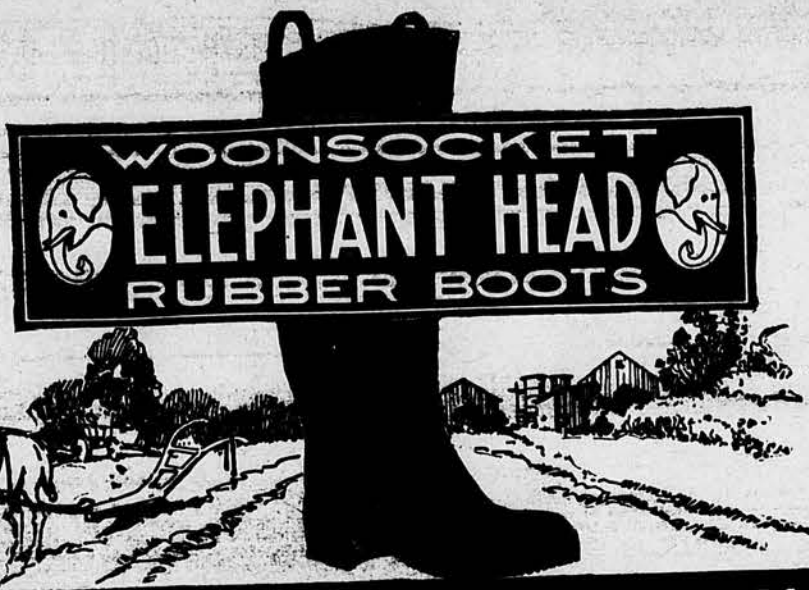
County Preacher and Country Road.

We are told that St. Paul took the Appian Way. As that was a macadamized thoroughfare, his travel was conducive to the best results—he was made accessible to the people, and he was not tempted to swear. One of the reasons for the rapid spread of Christianity in those days doubtless was the fine condition of these old Roman roads. In these days we need some stronger attraction than a young preacher to draw the farmers from their homes on Sunday morning to travel through the impassable roads that mark so many country districts.—REV. C. M. MCCONNELL, Middlefield, Ohio.

"The counties can't do it all and the state shouldn't, but co-operation makes it easy for both."



THE FIRST OPERATION IN MAKING A GOOD DIRT ROAD.—NOTE THAT THE GAS ENGINE ROLLER TRAVELS THE CENTER OF THE ROAD, THUS SMOOTHING AND COMPACTING THE ROAD AS WORK PROGRESSES.



Buy These Rubber Boots and Be Sure-

- 1st. Be sure of long wear. ELEPHANT HEAD RUBBER BOOTS are made of pure, high grade rubber and tough selected duck reinforced at every seam and joint.
- 2nd. Be sure of comfort. ELEPHANT HEAD RUBBER BOOTS are lined with soft wool net and are made to fit comfortably.
- 3rd. Be sure of square treatment in the store where you buy your footwear. Only the best dealers are permitted to sell them.

All the better dealers sell ELEPHANT HEAD RUBBER BOOTS. You can depend on anything you buy in the stores that have them.

WOONSOCKET RUBBER CO., Woonsocket, R. I.

How Mrs. Robinson Makes Soap



The Black Quaker is on every label

If all housekeepers made their own soap at home, they would never have reason to complain about extra rubbing and scrubbing to get things clean.

Mrs. Robinson has made her own soap for 15 years—whiter, purer and better soap than probably you've ever used. Mrs. Robinson uses



Lewis' Lye

"The Standard for Over 50 Years"

and has always had perfect success. Her famous recipe appears on page 5 of the Lewis Lye booklet, sent free to any address.

Aside from its use in soap-making, the cleansing properties of Lewis' Lye renders it the most valuable agent for removing dirt and grease from floors and woodwork, Pots, Pans, Kettles, Kitchen Sinks, Closets, etc. It Cleans Without Scouring. Send for booklet describing its many other uses on the Farm and in the Home. Address

PENNSYLVANIA SALT MFG. CO.

Manufacturing Chemists

PHILADELPHIA



WAITING FOR YOU

Yes, waiting for every farmer or farmer's son—any industrious American who is anxious to establish for himself a happy home and prosperity. Canada's hearty invitation this year is more attractive than ever. Wheat is higher but her farm land just as cheap and in the provinces of Manitoba, Saskatchewan and Alberta

160 Acre Homesteads are Actually Free to Settlers and Other Land at From \$15 to \$20 per Acre

The people of European countries as well as the American continent must be fed—thus an even greater demand for Canadian Wheat will keep up the price. Any farmer who can buy land at \$15.00 to \$20.00 per acre—get a dollar for wheat and raise 20 to 45 bushels to the acre is bound to make money—that's what you can expect in Western Canada. Wonderful yields also of Oats, Barley and Flax. Mixed Farming is fully as profitable an industry as grain raising. The excellent grasses full of nutrition, are the only food required either for beef or dairy purposes. Good schools, markets convenient, climate excellent. Military service is not compulsory in Canada but there is an unusual demand for farm labor to replace the many young men who have volunteered for service in the war. Write for literature and particulars as to reduced railway rates to Superintendent Immigration, Ottawa, Canada, or to

GEO. A. COOK,

125 W. 9th St.

Kansas City, Mo.

Canadian Government Agent.

LIVE STOCK



"The heavy-muscle draft horse and the horny hand of the laboring man furnish the foundation of all productive industry." These are the words of H. G. Meyers, of Jewell County, spoken in conversation with the writer in the course of a discussion on the status of the horse breeding industry. This is but another way of stating that efficient physical labor is at the bottom of all material wealth. There has been more or less timidity displayed in regard to the future of the horse business. Admitting the correctness of this fundamental statement made by Mr. Meyers, it would seem that there must still be a most important place for the draft horse to fill as a producer of material wealth.

This country will undoubtedly have the opportunity to demonstrate what its breeders can do in the maintaining and improving of such good draft horse blood as we have, in the very near future. There has been more or less increase in the interest in good horses of this type during the past year or two. The improvement as regards the establishing of ideal types has been most noticeable in communities where, as a result of good leadership and co-operation among breeders, colts and shows and other similar events have been frequently held. The total lack of uniformity in the types of horses grown through the country as a whole is most noticeable.

Improvement can come only through the making of close studies of the most desirable types both for farm purposes and the city trade where most of the surplus horses go. This involves the education of those who are taking up the business of producing horses.

The writer recently visited Jewell County, which is by nature especially adapted to the production of good draft horses. The occasion of this visit was the annual meeting of the farmers' institute, which held a two days session in Mankato, and the holding of a banquet by the Improved Stock Breeders' Association of that county in conjunction with the Improved Farming Bureau. This county is a county of diversified farms. Alfalfa is more generally grown here than in any other county in the state. Carrying on the work of these farms in an up to date manner requires efficient horse power.

The farmers and breeders of this county are united and are working in harmony along the line of educating the rising generation in the formation of correct ideals as to the most efficient types of farm animals. The annual colt show which is held in Jewell City each year is more than a place where prizes are awarded for those showing the best animals. This show is worked out along the line of developing the why of the best animal in every case. The exhibitors are not satisfied to have the judge simply award the prizes. He is asked to state publicly just why the various placings were made, and the writer can speak from experience as to the interest taken in this phase of the colt shows held each year in this county.

The county is especially fortunate at the present time in having as its county agent Ambrose D. Folker. Mr. Folker is a most enthusiastic believer in the development of the live stock farm as a means of promoting the agricultural welfare of his county. No matter what his text, he almost invariably gets around to the need of high-class live stock before he gets through. As a means of furthering the development of proper ideals in live stock among the young men and boys who are to be the farmers of the future, he, in co-operation with the county superintendent, O. M. Chilcott, and the many teachers of the county, has conducted during the past fall numerous live stock demonstration classes throughout the county. It has been Mr. Folker's custom in connection with these demonstration classes to have a good draft horse led before the class and then carefully point out the essential characteristics of this type to the class assembled. Thirty-five events of this kind have been conducted at the various schools of the county previous to the annual meeting of the farmers' institute which was recently held in Mankato.

In order to continue the interest in this educational work, a series of contests for the boys of the county had

been arranged to be held during the sessions of the institute. The prizes offered consisted entirely of free trips to the state institute held in Manhattan between Christmas and New Year. Mr. Folker had arranged to have for these contests some splendid draft mares of the Percheron breed. Before the boys were asked to place the animals in the order of their respective merit, writing their reasons for the placing, a lecture was given, using one of the animals to illustrate the various important points constituting excellence in the draft horse type. As a result of Mr. Folker's voice being almost out of commission from much talking, the live stock editor of KANSAS FARMER was asked to give this lecture.

It is seldom that a class of this kind has as good an example of proper type in the draft horse as was led into the ring at the time. It may be remembered by some that R. E. Loomis, of Jewell County, was present at Lee Bros.' sale of pure-bred Percherons held in Manhattan last January. This young man and his brothers purchased in this sale the three-year-old mare, Marcellene, the grand champion mare of the fair circuits last fall. In addition four other pure-bred mares were purchased. Mr. Loomis brought Marcellene and another high-class Percheron mare a year younger to be used in this boys' contest. The mare, Marcellene, presents a splendid type to breed to in the production of high-class draft horses. She possesses the smooth properly sloping shoulder with broad short back, heavily muscled quarters and broad smooth hip and rump. She stands up high enough to meet the demand for draft horses with a reasonable degree of smooth free action. Her legs are squarely placed and she possesses an abundance of bone for a draft horse of her size. The young men of the class had their attention called to all the points of excellence which this mare possesses, and likewise the points where she might be criticised.

Two of the other mares in the class were owned by the county farm of Jewell County. These mares were grades only, but were most excellent types of Percheron draft horses. The commissioners of this county have for a number of years carried out the idea that the county farm should be used as far as possible in demonstrating good types of farm animals and proper methods of farming. The mothers of these mares were purchased some years ago for work animals and the mares shown were foaled on the farm.

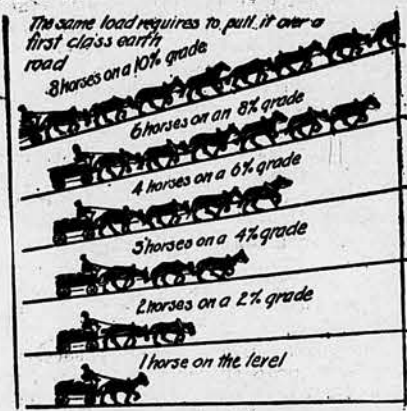
The question may arise as to whether the average farmer can afford to put as much money into his farm work mares as really good-type mares cost at the present time. It may be remembered that the Loomis Brothers paid \$750 for Marcellene. If this mare had produced a foal, as probably was the hope when she was purchased, this colt when matured would have stood a good chance to have paid the original cost of the mare. Under proper management, mares of this kind can be used in connection with farm work and very nearly, if not quite, pay the full cost of their keep in the work they do. The owner of such mares, however, must take the greatest of interest in horses and have them constantly under his personal supervision. The true lover of a good horse never is satisfied unless the horses he owns are properly cared for at all times.

We were much impressed with the statements made by Mr. Meyers, whose name has already been mentioned. Mr. Meyers is one of the pioneer farmers of Jewell County and has grown high-class horses for many years. He has spent thousands of dollars in the purchase of good stallions to use on his farm. Mr. Meyers is one of the kind of men who have that natural love for a good horse which is bound to make them successful in growing and caring for horses. Mr. Meyers was asked how he managed to perform all the work on a large farm with high-priced Percheron mares. He stated that he and his sons keep all the work of the farm, to a large extent, under their personal supervision. The men they hired were given to understand that unless they were good horsemen and treated the horses of the farm with such care and consideration as is necessary in handling brood mares for working pur-

poses, their services would not be required on the farm. Mr. Meyers carries out the practice of always keeping on hand a team of good draft geldings. By keeping this kind of a team he is always in a position to spare the mares when at any time it becomes necessary to pull a heavy load or do any especially heavy piece of work.

It is quite the habit of the born horseman to become so attached to his horses that he will not sell them when the proper time comes. Mr. Meyers was asked if he permitted sentiment to enter into his business when it came time to dispose of a team of high-class geldings. He replied by saying that he always became very much attached to a fine team but had found that he could not afford to let sentiment interfere when the animals had reached their prime. He always had a new team coming on and always sold the older teams before they began to depreciate on his hands. This is a point well worth observing from the standpoint of making the production of draft horses on the farm a paying business. The work on the farm should be done as largely as possible with the brood mares and the young horses and colts.

In view of the fact that there is certain to be a world shortage of good work



A LOAD THAT ONE HORSE CAN PULL ON THE LEVEL REQUIRES EIGHT HORSES ON A TEN PER CENT GRADE.—THAT'S THE REASON FOR CUTTING DOWN THE GRADES.

horses in the near future, the production of high-class drafters offers splendid possibilities, from a financial standpoint, to the young man who has the natural instincts of a horseman and is so situated that he can carry on his farm successfully with good brood mares. The mares themselves should be carefully selected from the standpoint of good draft horse type, giving special care to the matter of soundness. The stallions used should likewise be of approved type and absolutely sound. There has been great improvement in the type of stallions used, but there is still room for a great deal more improvement along this line. Nothing will bring this about more surely and quickly than a general demand by mare owners all over the country for nothing but the best in the stallions they patronize. We occasionally see our present stallion law criticised because it is not severe enough and does not absolutely eliminate unsound and grade stallions. A law of this kind cannot be very much in advance of the general sentiment. When the people as a whole demand the legislation of the grade stallions out of existence, it can be easily done.

With the splendid work being done by the various organizations in Jewell County in an educational way, looking toward the improvement of the live stock of the county, it will not be long before a grade or inferior stallion will be a curiosity in this county. In our visiting of live stock communities we have not often observed a more united effort to all get together in the interest of better stock of all kinds than we observed in our recent visit to Jewell County.

Clean Wormy Corn with Sheller.

"In your issue of November 21, H. M. F., Republic County, states that his corn is badly damaged this year by the corn ear worm and inquires if it is dangerous to feed this corn to horses," writes George W. Williams, institute lecturer for Missouri. He says further:

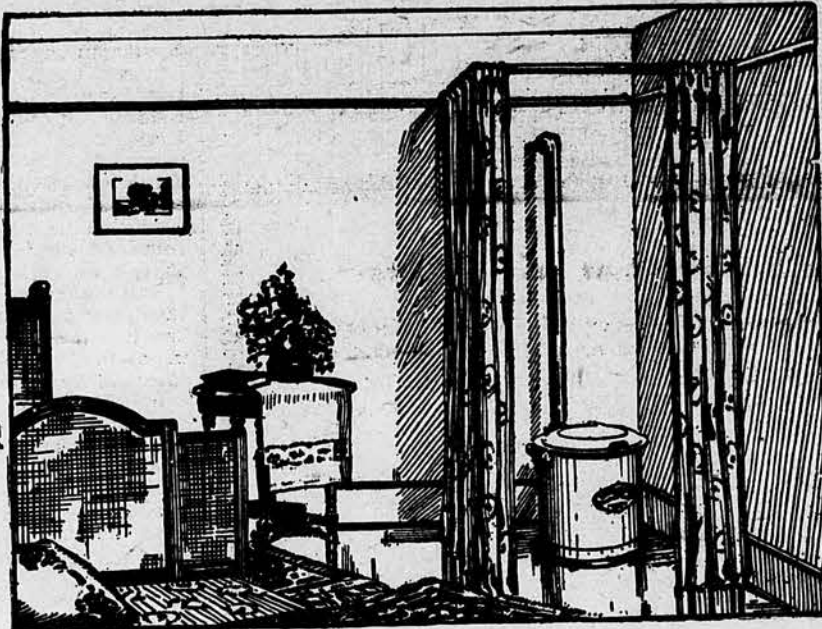
"It is not only the corn ear borer that works in the corn kernel sometimes from end to end of the ear, that damages corn the heaviest, but the so-called cotton boll worm. These work on the outside of the ear under the husk and each of the three varieties of this insect operates in a little different way. They leave excrement and a mold follows. This is poisonous and corn so affected should be fed sparingly, as the dust or mold finds its way up the nostrils of the horse and clogs up the eye ducts—

You've Needed One For So Long—

—an indoor closet—and now it is easy for you to have one. No longer need you suffer the inconvenience and discomfort of the outdoor closet. No longer need the health of your wife and children be in danger.

We have done away with the big cost of an indoor closet by perfecting a chemical system that requires no sewerage or cesspool connection.

Illustration shows how many folks install their "Waterburys" in their bedrooms.



The cut below shows the Waterbury with air-tight cover lifted.

Something you've always wanted—needed—and which now you can afford to buy.

THE WATERBURY SANITARY CLOSET

ALL METAL—CHEMICAL

is a complete system within itself, combining an artistic, nicely finished indoor closet with a safe, sanitary, odorless method of sewage disposal.

It makes no difference where you are located—in a small town which has no sewer connections, on the farm, or anywhere—you can install the Waterbury Sanitary Closet in a few minutes and enjoy the comforts and convenience of an indoor closet.

also of the odorless and sanitary features. Thousands of "Waterburys" have been sold and are giving entire satisfaction. We'll gladly refer you to any one who has bought one. You take no risk in buying a "Waterbury."

No Sewer Connections Needed

The Waterbury Sanitary Closet can be placed in any room, hallway or closet. Many folks put it right in their bedrooms. All you have to do is to connect the ventilating pipe with a chimney or run it through the roof and the installation work is done.



Guaranteed Odorless

The "Waterbury" is sold under a real guaranty, backed by a big responsible company. It assures you not only of the quality of materials and workmanship, but

Write For Free Book

explaining the construction of the Waterbury Sanitary Closet and how the Waterbury Chemical System does away with the necessity for sewer connections. If you want to put an end to the inconvenience, discomfort and health-risk that yourself, your wife and children have to put up with, get this book and learn all about the Waterbury Sanitary Indoor Closet.



The Waterman-Waterbury Co.,

1151-65 Jackson St. N. E., Minneapolis, Minn.

these are little channels about as large as a wheat straw leading from the eyes into the nostrils. This clogging causes irritation which finally assumes the form of blind staggers and which results in death to the animal.

"Worm affected corn should be shelled through a sheller which has a fan and which implement will remove so much of the worm mold that there will be slight danger of blind staggers. A hand sheller will cost about six dollars and the cobs from the corn, if used for firewood, will more than pay for the trouble of shelling."

Cane for Brood Mares.

Answering C. B. F., Jefferson County: There is a prejudice among horsemen against the feeding of cane to brood mares. There is no definite information as to whether or not it is really injurious but the above mentioned prejudice must have some foundation and we conclude, therefore, that it would not be safe to feed mares considerable quantities of cane seed. We would not feed cane at all which had been grown thin for seed and which was heavily seeded, but cane which has been sown thick for forage and having small heads thereon and accordingly a large percentage of stalk

and leaf to seed, we think would not be dangerous. The fact is that this sort of cane is fed to brood mares on probably 60 per cent of all the farms in Kansas. It is fed, of course, with other hays and so is not used exclusively.

It is claimed that seed of cane has a tendency to decrease the flow of milk in dairy cows. A surplusage of cane seed in the roughage and eaten in large quantities, we know from experience, does decrease the milk flow. It is our conclusion, though, based on our experience, that this is not because of the direct effect of the seed but because when there are large quantities of seed in the cane it is readily eaten and this is not the kind of feed which produces milk. This, on the same theory that you would not get a large flow of milk if a cow were largely fed on the grain of corn, kafir or other feeds rich in carbohydrates. Cane seed has a feeding value, pound for pound, when properly balanced with other feeds, near equal to corn, kafir, milo, etc.

The feeding of cane silage is not a complete feed for a milk cow. It is rich in carbohydrates and must have alfalfa hay, cottonseed meal or some other protein concentrate to balance it. Moderately seeded cane silage has, so far as

we have been able to learn from feeders who have used it a number of years, been attended by no injurious effects. The fact is that a large part of the seed of cane in silage passes the animal undigested and there is no advantage in silaging cane which is heavily seeded. On the occasion of the Dry Farming Congress at Wichita a few weeks ago, Professor Reed, dairyman of the Kansas Agricultural College, recommended that in the case of heavily seeded kafir the heads be removed before putting the roughage in the silo. This because so much of the grain is not used by the animal. We asked him if he would top kafir which had been planted thick for roughage and which yielded twelve to fifteen bushels per acre. He said he would not top such kafir.

Wide Wagon Tires Reduce Draft.

On the common earth roads and in the field horses can on an average pull 50 per cent more load on a wide-tired wagon than on one with narrow tires. In other words two horses can pull as much load on the wide tires as three can on a narrow-tired wagon. The wide tires help pack the road, the narrow tires make ruts.

Carbon Deposit

Barring mechanical troubles and faulty carburetion (too much gas) and ignition, carbon deposit from lubricating oil may be summed up as follows:

Carbon Deposit is caused by excess lubricating oil burning in the combustion chambers.

Prevent the presence of excess oil and you avoid undue carbon in your combustion chambers.

In some motors, the piston stroke will, by suction, draw a light oil too freely to the piston heads. In other motors, a heavy oil will work to the piston heads.

In either case excess carbon will deposit. The remedy is obvious.

Keep excess oil from your combustion chambers by using an oil whose body and quality fit the mechanical conditions of your motor.

Every day it is being demonstrated that Gargoyle Mobiloils give remarkable freedom from carbon deposit.

It is simply because the grade of Gargoyle Mobiloil recommended for each car is fully suited to that motor's mechanical condition.

The Lubricating Chart on the right will show which grade to use on your car. A copy of our Complete Chart will be sent you on request.

On request we will send a pamphlet on the Construction, Operation and Lubrication of Automobile Engines. This pamphlet describes in detail the common engine troubles and gives their causes and remedies.

Stationary and Portable Engines and Tractors

For all types of Gasoline and Oil Engines. *Water cooled*—Use Gargoyle Mobiloil "A" in summer; use Gargoyle Mobiloil "Arctic" in winter. *Air cooled*—Use Gargoyle Mobiloil "B" the year 'round. Tractors—Use Gargoyle Mobiloil "B" the year 'round.

Mobilubricant—In the new patented Handy Package. The correct grease for compression cups, for power-transmitting parts of automobiles and for lubricating farm machinery. The spout fits the filling plug opening of the Ford, and all other cars. To expel the grease—turn the key. No dirt—no waste—no trouble. Sold in one and three-pound tins.



Mobiloils

A grade for each type of motor

The various grades of Gargoyle Mobiloils, purified to remove free carbon, are: Gargoyle Mobiloil "A," Gargoyle Mobiloil "B," Gargoyle Mobiloil "E," Gargoyle Mobiloil "Arctic." They can be secured from reliable garages, automobile supply houses, hardware stores and others who supply lubricants.

It is safest to buy in original barrels, half-barrels and sealed five and one-gallon cans. See that the red Gargoyle, our mark of manufacture, is on the container.

For information, kindly address any inquiry to our nearest office. The city and state address will be sufficient.

VACUUM OIL COMPANY, Rochester, N. Y., U. S. A.

Specialists in the manufacture of high-grade lubricants for every class of machinery. Obtainable everywhere in the world.

Domestic Branches:

Detroit Boston New York Chicago Pittsburgh Philadelphia Indianapolis Minneapolis

Cushman Light Weight Truck



This is the light-weight, quick-action 4 H. P. Truck Outfit that has proved so handy for farm work. A boy can pull it around from job to job, yet it easily handles all work up to 4 or 4½ H. P. Pump circulation to water tank on front of truck prevents overheating, even on all-day run. Cushman Engines are not cheap engines, but they are cheap in the long run. They are built to run without trouble, and are the most useful engines made.

For All Farm Work

And For the Blender

Very light weight and steady running permits Cushman Engines to be attached to other machines, such as harvesters and balers, as well as doing all regular stationary jobs. 4 H. P. alone weighs only 190 lbs.; 2-cylinder 8 H. P. only 320 lbs. Throttle governed; economical of fuel. 4-Cycle. 4 to 20 H. P. Runs at any speed; speed changed while running.

C. M. Scott, Pawnee City, Nebr., says: "I bought a 4 H. P. Cushman and think it is the finest engine I ever saw run. Am grinding shelled corn—can grind 30 bushels per hour with 6-inch buhr grinder. Have seen a great many other engines, but the Cushman has them beat at every turn."

ASK FOR FREE ENGINE BOOK
CUSHMAN MOTOR WORKS
822 North 21st Street, Lincoln, Nebraska

H. A. Mason, Gypsum, Kas.
"I have never had an instant of trouble with my 4 H. P. Cushman. It is the best machinery investment I ever made."



FILL IT ONLY ONCE A WEEK CLEAN IT ONLY ONCE A YEAR

Here's the simplest, cleanest and most easily operated lamp of them all—the Coleman Air-O-Lite. Gives you less trouble, requires less care than any other. No wicks to trim, no chimneys to clean, no greasy oil lamps to fill. No batteries or engines to fuss with. No smoke, no soot, no odor. Nothing to clog up or get out of order.

THE COLEMAN AIR-O-LITE

is a beautifully shaped and finished portable table lamp that makes and burns its own gas. Furnishes bright and cheerful, yet mellow and eye-resting light at only 1-10 the cost of kerosene lighting. Will give you 300 candle power (the equal of 20 oil lamps) at only 1-3c per hour.

A SPLENDID CHRISTMAS GIFT

Absolutely safe, conforms to underwriters' rules, no danger even if tipped over, burns dry without exploding. Guaranteed for 5 years. Write for free literature containing prices, descriptions and showing many beautiful styles of ornamental Air-O-Lite shades. Agents wanted. Experience unnecessary. Good pay offered. Write nearest address of

THE COLEMAN LAMP COMPANY
225 St. Francis, Wichita, Kansas. 419 Akard Street, Dallas, Texas.

READ KANSAS FARMER'S CLASSIFIED
ADVERTISING PAGE FOR READY BARGAINS

THE FARM



SUBSCRIBER L. R., Dickinson County, asks if Sudan grass will make a permanent sheep pasture. He also states that he is thinking of seeding twenty-five acres to Johnson grass for permanent pasture.

Sudan grass will not provide a permanent pasture. It must be seeded from year to year. In a pasture test at Dodge City during 1914, the following particulars may be of interest. Sudan grass was seeded May 20 with a wheat drill at the rate of twenty-three pounds per acre. Cows were turned onto the grass June 24 and received 230 days pasture to July 8. On this date the stock was taken off until July 27 and continued grazing until August 12 when the animals were again taken off pasture. The stock was turned on again September 14 and taken off September 21, making a total of 375 days pasture for one animal from the three acres of Sudan grass. This will give our subscriber an idea of the amount of pasture produced by Sudan grass under lighter rainfall than he has in Dickinson County. It will be seen how if there had been the second pasture of Sudan grass for the use of the stock, that continuous summer pasture could have been obtained. The second pasture is necessary in order that the first may have a chance to recuperate.

We would not recommend the seeding of Johnson grass. This because there is danger of its taking not only the farm on which it was originally sown, but because of the danger of spreading to other farms in the neighborhood. Johnson grass is regarded as making a satisfactory hay for horses and cattle. In feeding constituents it is comparable with thick sown cane producing fine hay. Johnson grass is a sorghum. The forage is very similar to that of Sudan grass. A Texas farmer writes: "Johnson grass would be a good thing on a place if you could keep it where you wanted it." It might seem that the danger of spreading Johnson grass could be averted by keeping the grass closely grazed or by cutting the hay before the seed is ripe, but such is not the case. The first crop of the season ripens irregularly and some stalks have ripe seed before others have begun to head. Johnson grass is not satisfactory for permanent pasture. The amount of forage it provides decreases rapidly from year to year. It makes little growth in exceedingly dry weather but lies dormant and when the rains come grows vigorously.

The attention of our subscriber is directed to page seven of the October 10 issue of KANSAS FARMER, on which is printed the Kansas law relative to Johnson grass. This is an act to restrict the spreading of Johnson grass and prohibit the sale or importation of the same within the state and providing penalties therefor. The law says it shall be unlawful to introduce into the state to sell or to offer for sale, any seed or roots of Johnson grass. The law further provides that persons permitting Johnson grass to mature seed on any land shall be liable for all damages resulting from the spreading of such noxious plants to any land contiguous thereto. There are many other points in the law which tend to show the damage resulting to a community through the introduction of Johnson grass.

Only last week we were in Jewell County, this state. Johnson grass is found in the northern part of that county. It has been the belief of Kansas farmers that Johnson grass would not survive the winters of the north half of the state. The existence of this grass in North Jewell County would indicate that we can expect the grass to prove a pest in all sections of the state should it be introduced. We recommend that our subscriber reconsider his intention to seed twenty-five acres of his farm to this grass.

Cured Frosted Cane Not Damaging.

Subscriber J. W. K., Pottawatomie County, writes: "Is cane which has been severely frosted and cut and shocked and allowed to thoroughly cure, dangerous as a horse feed? My neighbor tells me that cane exposed to severe frost is poisonous."

This question has been answered numerous times in KANSAS FARMER this

fall. This subscriber seems to think that because the cane was badly frozen, it may give damaging results as a feed. There is no evidence, so far as we know, that badly frozen cane is likely to be more dangerous as a feed than cane lightly frosted. Neither is there evidence that frosted cane is poisonous in any degree after it has been cut, shocked and cured. The fact is that there are only one or two instances of record in which stunted cane, either of first or second growth, has proven damaging to live stock when fed after curing or as silage. An ounce of prevention is always worth a pound of cure, and our subscriber may protect himself by feeding cautiously to one animal before he begins feeding the entire herd.

Seeding Sweet Clover in Rye.

Subscribers B. Brothers, Barber County, write: "We have fifty acres of land, mostly high and sandy, which we desire to seed to sweet clover. We cut kafir from this land this fall and sowed it to rye. Could we broadcast this in the spring to sweet clover and get a stand by letting stock tramp it in while pasturing? Does sweet clover live through the winter as does alfalfa? What is the seed worth per bushel?"

It is our judgment that the suggested method of seeding would give satisfactory results. It would be better by far, we think, to seed on the ground in this condition than to plow or otherwise work the light land preceding the sowing. The seed in such land would be covered satisfactorily by the tramping of stock and at the same time the firmness of the seed bed would be increased as it should be. The seeding should be done early in the spring—we think the earlier the better, although growers seem partial to February seeding. Nature's plan is to let the seed lie in the ground all fall and winter, but it must be remembered that as the seed falls from the plant it retains the hull whereas seed sold on the markets is generally hulled, the latter being more easy to germinate than that which is unhulled.

During a favorable season we do not believe the growth of rye likely to be detrimental to the stand of sweet clover, although in the western two-thirds of Kansas in ordinary seasons it is pretty generally conceded that nurse crops are disadvantageous, the idea being that the crop sought to be established needs all of the soil's moisture. The rye should not be pastured late in the spring to the detriment of the young sweet clover plants.

It is to be remembered that both the white and large yellow sweet clover are biennials. That is, the plants live through two growing seasons only. The first winter following seeding the plant lives, not having seeded the first year. The second year it seeds and dies.

The seed of white clover—that variety which gives best results—is now selling at 25 cents a pound, and dealers advise that it is likely to go to 30 cents before a great while. The production of seed this season is said to have been light and the demand heavy.

Sod Crops in Wichita County.

Subscriber J. K. K., Barton County, writes that he will break some Wichita County upland sod next spring and desires to know the crop which will do best thereon.

We would plant this sod land to kafir, milo, feterita, Sudan grass or cane if a spring planted crop is desired, working the sod down with a disk and seeding with a disk drill and closing such holes of the drill as would be necessary to plant the crop in rows at about the same distance apart as corn.

If a spring planted crop is not desired, then the land should be disked in preparation for wheat the following fall. The disk should be so thorough as to destroy the sod and also to prevent the rains from running off. It should be a question of handling the soil with a view of getting into it all the water possible and to retain in it as much moisture as possible.

"Drag your roads and have them smooth when the frosts of winter come, and then all winter you will have level roads to travel on."

DON'T BURN YOUR STRAW!

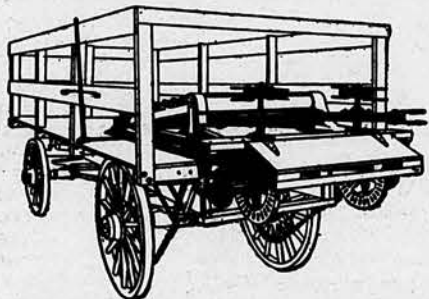
Make \$2.50 a Ton From It Right on Your Own Farm

You don't see many burning straw piles any more, because farmers have found that, properly used, the straw from a forty-acre field is worth \$100 in gold.

By spreading straw hundreds of farmers in the wheat belt have increased their wheat yields five bushels an acre. Besides this, they have also almost entirely stopped crop losses due to soil blowing. Farmers realize that the time is past when they can afford to go on year after year raising smaller crops—or to lose them by soil blowing.

Other methods may be all right, but the quickest, cheapest and surest way to stop soil blowing is to spread straw—a straw spreader solves this problem. With a straw spreader you can easily cover twenty acres or more a day, and besides protecting your crop from the winds you increase the fertility of your land at the rate of \$2.50 for every ton of straw you spread and insure your crop a good supply of moisture whether the rainfall is up to standard next summer or not.

Professor W. M. Jardine, of the Kansas State Agricultural College, in a recent address, urged the farmers to return every ton of unused straw to the land. William Knop, of Preston, Kansas, reports that his straw spreader makes him \$500 a year easily. Curtis M. Brown, Jos. Pfoff, C. H. Peterson and scores of others who have used straw spreaders for several seasons say they are big money makers and that they could not afford to be without them.



The Simplex Straw Spreader can be attached to any header barge or hay frame in a short while and the cost is a mere trifle compared to what it will make you in a single season. Besides being used for a straw spreader it can be used for spreading manure. Many farmers who own both use the straw spreader for spreading manure and let their manure spreader stand idle or sell it because they like the way the "Simplex" spreads manure the best.

The Manson Campbell Company, 844 Traders' Building, Kansas City, Missouri, will send any farmer a brand new Simplex Straw Spreader, without the payment of even \$1 down, to be used on a thirty-day free trial. If you are satisfied with the spreader you can have a whole year to pay for it. No farmer can make a mistake buying a straw spreader on this plan because it will pay for itself ten times over the first season.

A very interesting book on straw fertilizer and soil blowing has been issued by the Manson Campbell Company. It contains pictures and letters of scores of the best-known farmers who have used straw spreaders for several years. It will be sent free to anyone who writes for it.—[Adv.]

North Platte Valley

is rich in crop-raising soil—irrigated and non-irrigated. Large or small tracts. Easy payments. If you are preparing to go to a new country you will certainly investigate the rich and productive lands of the North Platte Valley, Nebraska. I have complete and authentic information and will gladly send it to you free.

R. A. SMITH

Colonization and Industrial Agent,
Union Pacific R. R. Co.,
Room 3719 Union Pacific Bldg.,
OMAHA, NEB.

THE OLD RELIABLE ANTI-FRICTION FOUR-BURR MOGUL MILLS



BOVEE GRINDER AND FURNACE WORKS
24 Eighth St., Waterloo, Iowa.

No gearing, no friction. Thousands in use. Four horse mill grinds 40 to 80 bushels per hour; two horse mill grinds 20 to 40 bushels per hour. We make full line of FEED MILLS, best sold, including famous Iowa Grinder No. 2 for \$12.50. Send for free catalog.

Milk Cow Ration.

We have an inquiry from E. V. S., a Reno County reader of KANSAS FARMER, regarding the proper feeding of some milk cows during periods when the wheat can not be pastured. These cows are now running on wheat pasture without other feed and are producing on an average one pound of butter fat daily per cow. The problem is how to maintain this production during such periods as are bound to occur during the winter when the wheat cannot be pastured. Alfalfa is quoted at \$15 per ton, cottonseed meal at \$36 per ton, and bran at \$28 per ton. No silage is available.

It is difficult to abruptly change good milk cows from wheat pasture to a satisfactory dry ration. The dry ration lacks in palatability, no matter how completely it may supply the necessary nutrients. The cows do not take kindly to the change, consequently several days are required to get them accustomed to the new ration. If silage could be used to take the place of wheat pasture the change would be less abrupt, since silage is of a succulent nature and has well been spoken of as the same as grass in the winter time.

From the standpoint of nutrients, the ration must have in it some concentrate rich in protein. This can most cheaply be supplied in the form of cottonseed meal. Three pounds of cottonseed meal daily per cow, with a pound or two of bran to lighten it up and in addition about three pounds daily of corn, which in this case is in the fodder, will supply nutrients in about the right proportion and amounts for the production of twenty-five pounds of average milk daily. Of course, the supplying of some oat straw in such quantities as the cows would consume it would be necessary to complete the ration.

The necessity of feeding bran might be eliminated by feeding the cold pressed cottonseed cake instead of the prime cottonseed meal or cake. The cold pressed cake contains the hulls of the seed and is more bulky. It can be purchased on the market usually for about \$5 less per ton than the prime meal. It contains a smaller percentage of protein and other digestible nutrients, consequently it would be necessary to feed a larger quantity. About four pounds of the cold pressed cake should be the equivalent of about three pounds of prime cake.

If some sort of a grinder could be used to grind kafir or milo in the head form, or corn in the ear, cottonseed meal could be mixed directly with this course meal and thus make it necessary to use the bran in the ration. The item of labor should, of course, be considered, since the cost of husking the corn and grinding it might more than counterbalance the buying of the bran necessary to lighten the cottonseed meal ration.

Long Time Renter Has No Claim.

J. L., Elk County, writes: "I have eighty acres of land that I have rented to one man for fourteen years. If I rent the land to him one more year can he hold the land as his own, having rented it for fifteen years?"

There is no law in Kansas—or, so far as we know, in any other state—which will give a man title to property following fifteen years of rental, and our subscriber is perfectly safe in renting this land for another year or for another term of fifteen years or longer if he so desires. It is not uncommon in the cities of this and other states to rent or lease property for terms of fifteen years or longer and even to ninety-nine years. The owners of such property would not be leasing for such terms if there were danger of forfeiting their ownership to the tenant.

Silos at Panama-Pacific.

Six big wood stave silos are being erected and will be filled for the maintenance of view herds at the Panama-Pacific Exposition. This the first time a world's exposition has arranged to supply the herds there shown with silage. The buildings of the live stock department cover sixty-five acres and the buildings were erected at a cost of \$125,000. Some \$450,000 is offered in prizes and purses for the live stock exhibits and the harness races on the mile track adjoining the live stock department.

The Holstein-Friesian cow Duchess Hengerveld Korndyke has broken the record for fat production in the senior three-year-old class of the semi-official yearly division, by producing in 365 consecutive days 903.38 pounds fat from 22,879 pounds milk. She freshened at the age of 3 years, 9 months, 19 days. She was bred by O. A. Stubbs, Lewisville, Ind., and she is now owned by Emblagaard Dairy, Big Bay, Mich. Five different supervisors were employed in the conduct of this test.

The Xmas Gift is



Waterman's Ideal Fountain Pen

A Gift that is Useful
Every Day of the Year

Waterman's Ideals are carefully made of materials that will last for years. They are beautiful in finish and design. No other pen has the successful patented parts or pen ideas that this one has. Used with satisfaction and saving throughout the world. In attractive gift boxes. Illustrated folder upon request.

Sold at the Best Stores

L. E. Waterman Company,
173 Broadway, New York

Ask for
this pen by
name—Waterman's
Ideal. The genuine.

For the
most satisfac-
tory ink—ask for
Waterman's Ideal.

LIMESTONE PULVERIZED

THE BEST FERTILIZER KNOWN

Can now be secured from the

Fredonia Portland Cement Company

\$1.00 Per Ton, at The Plant.

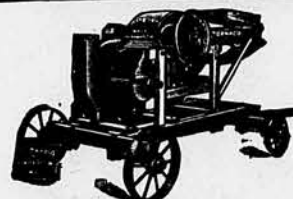
Pulverized limestone is the one element necessary to combine the potash and phosphorus in your farm land into plant food. It is easy to apply at any season of the year, contains no weed seed, has no disagreeable odor, and is therefore the cheapest and best fertilizer known. Recommended by Agricultural Colleges and Experimental Stations everywhere. If your land is not producing as much grain as the best land in the state, it needs toning up. IT COSTS AS MUCH TO CULTIVATE A POOR ACRE AS IT DOES A GOOD ONE.

Make Your Acre a Good One by Apply- ing Pulverized Limestone Fertilizer

To learn how to test your land, and more
about pulverized limestone as a fertilizer, write

FREDONIA PORTLAND CEMENT CO.

Fredonia, Kansas.



Write for Prices and
Descriptive Catalog.

THE TORNADO Best Dry Fodder Cutters

No hard sharp edges to cause sore mouths.
SPECIAL SIZES FOR GASOLINE
ENGINE POWER.

EQUIPPED WITH TRAVELING FEED
TABLE, CARRIER OR BLOWER.

W. R. HARRISON & CO., Mfgs., Massillon, O.



The New Reo The Fifth—"The Four"

WHAT NEED WE ADD to what you already know of this great car? For of course you do know? If you have not owned one, you have many friends who do. And they have doubtless told you in more extravagant terms than we would care to use.

MORE THAN 40,000 of them are today in hands of users. 12,000 were sold last season.

AND AS PROVING the popularity of this model we need only say that on November 10th the last Touring car left the Reo factory. And that for thirty days at least there has not been, so far as we know, a Reo the Fifth on any Dealer's sales-floor anywhere.

THE PROOF OF QUALITY in any product is "will it sell in the off-season?" Autumn is supposed to be the off-season for motor cars. Not for Reo cars though—we have never known a time when, even with our splendid factory facilities, we were able to make enough Reos to supply the demand.

WE HAVE JUST INCREASED our plant, nearly 50 per cent—necessary to produce the new "Six." And we hope to be able to more nearly supply our dealers this year than formerly.

AS WE HAVE NO AMBITION, however, to be maker of the most automobiles, but of the best, we do not expect, ever, to supply all the demand for Reo cars. That would be our idea of—well the reverse of success.

TO MAKE THEM EVER BETTER—so much better that, always, the demand will beckon the supply—that is our aim.

FOUR YEARS AGO we announced that, after more than 23 years of experimenting—testing—proving—we had produced a chassis that we believed was finality in all essentials of design. And we said so.

SOME FRIENDLY RIVALS laughed at that statement—said that changes would continue to come with the seasons—as they always had.

NEVERTHELESS we were certain in our own minds that, in the three-unit power plant and in other features that have become known as peculiarly Reo, we had established principles that would not change—so long at least as the principles of gas engines remained as they were.

IMPROVEMENTS? Refinements? Of course—but only in minor details. The world moves and of course we expect to move with it. Reo has from the first been in the van—we mean to stay there.

BUT IN THE FUNDAMENTALS of a self-propelled pleasure car, we were convinced we were right. Events have only served to confirm us in that belief.

FROM SEASON TO SEASON we have made such improvements as the progress of the science has made possible. And as our facilities have increased and our purchasing ability become greater, we have from time to time reduced the price of Reo cars at the same time that we have increased the quality and the size.

IN THE CASE OF THIS FOUR we have been able to do two things we had considered impossible—we have made a bigger, at the same time we have made a still better car.

HOW WAS THAT POSSIBLE? you ask. Tell you:—

THE MOTOR PROVED to have more power than was necessary—more than was really desirable for the weight of the car. Refinements, recently made, increased that power still more.

SO WE FOUND we could add three and one-half very desirable inches to the length of the car, give the buyer a more luxurious equipage, and yet have a car of ample power.

THAT DIFFERENCE IN LENGTH—and we made it wider at the same time—makes all the difference in the world in the capacity and the comfort of the car.

OTHER NOTICEABLE IMPROVEMENTS—in a car which formerly seemed almost perfection—are:

IMPROVED UPHOLSTERING—higher backs to seats.

IMPROVED WINDSHIELD support—with braces running from cowl to body sill—secret of success of "One-man Top."

POCKETS in all doors.

INSTRUMENTS mounted flush on instrument board.

HOOD FASTENERS—new and improved type. Stay put—and unfasten readily when you want them to.

ENTIRELY NEW TOP—a real One-man top. Can actually be put up or down by one man—after long use as well as when new.

WINDSHIELD—Oval moulding and pressed steel construction throughout. New method of fastening—and top attaches direct to windshield.

RADIATOR—New method of securing the frame—more flexible—prevents strains on roughest roads. More cooling capacity.

WHEEL BASE—increased three inches.

NOBBY TREAD TIRES on rear wheels and extra wide, over-size, demountable rims with new locking device.

SPRINGS—Improved method of lubrication for spring shackles.

STREAMLINE HUB CAPS—An exclusive Reo feature. Covers all bolt heads, dust and oil proof.

ANTI-RATTLER on brakes, and anti-rattling support.

IMPROVED STARTING mechanism—same system but doing away with shifting gears; also with sliding contacts and resistance. Silent; no over-running or roller ratchets nor any part to wear when car is in operation. We think it is perfection.

NEW HEADLIGHTS with hingeless anti-rattling doors and outside focus attachment.

NEW DESIGN FENDERS—crown type, closer fitting under pan.

NEW METHOD of supporting ignition coil. New design universal joint for generator—impossible for backlash or rattle to develop by wear.

NEW CYLINDER DESIGN—Independent exhaust ports. Injector type exhaust manifold. New low-pressure muffler.

NEW THREE-PIECE piston rings, giving greater power and acceleration.

IMPROVED VALVE operation mechanism—larger surfaces, ball joints, self-lubricating.

NEW ONE-PIECE cam shaft—larger bearings—and hardened and ground.

ADDED FRICTION SURFACE to clutch. New operating mechanism calling for less foot pressure.

EQUIPMENT—One-man top. Flush instruments; highest priced, d'Arsoval type ammeter—and the usual tools and accessories.

DELIVERIES BEGIN December 15th. Your local dealer will be able to show you and to take your order for this matchless car on or about that date.

Reo Purchasing Power Made The A Condition That Was Anxious To Others, Proved To Be Is

WE PROMPTLY TOOK and are giving you—full advantage of it.

READ CAREFULLY—It's the Silver Lining to the War-Cloud.

YOU ARE OF COURSE AWARE that the Reo Motor Car Company is financially the second strongest Automobile concern in the world.

OR WEREN'T YOU?—We had supposed that knowledge was common property. Anyway, you can easily ascertain the truth of the assertion.

WE WOULDN'T MENTION IT HERE, never have before—but it is necessary to state the fact in order to explain something that is otherwise unexplainable—the wonderful values we are able to give in the two Reo models shown and priced above.

FOR "WONDERFUL VALUES" is the only term that expresses it. Think of it! The New Reo the Fifth—that incomparable four, improved at many points and a larger car than its immediate predecessor—and at \$125.00 less than last season.

AND THE SENSATIONAL REO SIX—a Six designed and made the Reo way and with the Reo guarantee, at the amazing price of \$1385!

THAT CALLS FOR EXPLANATION—for you nor anybody else dreamed it would ever be possible to produce such cars at such prices.

SO SURE WERE WE OURSELVES of that, we went so far as to state in an advertisement a year ago "no maker ever can—not even Reo ever can—give greater value than this"—speaking then of Reo the Fifth at \$1175.

YOU RECALL THE STATEMENT doubtless—so when you saw the price, \$1050, quoted above—and realized also that this latest Reo the Fifth is a larger and an improved car, you wondered.

WELL, HERE'S THE ANSWER—and it's mightily interesting.

THE GREAT EUROPEAN WAR has created two sets of conditions—contradictory in some aspects.

FOR EXAMPLE, while we know that Six Hundred Millions of dollars go into American banks every thirty days—a guarantee of prosperity and of a market for automobiles in the coming months—at the same time you know that the banks are most conservative about loaning it out. And that is as it should be. Safety First.

AND SO YOU KNOW—stop it—that many manufacturers of other commodities, we find but who lacked a largeness of impossible to borrow due to these were necessarily in the production capacity to cope funds.

AND THAT WAS WHEREO—able financial position—the cash, and controlled, no sent but by the men who daft th—was able to avail itself con existed.

TO BUY WHEN OTHERS SELL—and when the practical petition in the buying.

TO MAKE MORE CASH a time makers must perforce—and ready for our dealers a home mand will be heaviest.

NO ONE COULD HAVE RES—tion that had arisen. Best world affairs did not ate the time when we said, "the b ever be possible for us," of course, the normal cons th Those conditions change ni

WHY, A FEW MONTHS, if wanted a few thousand of s kind, he had to go to all wait his turn.

THEN THE WAR—That, the stagnation for a time.

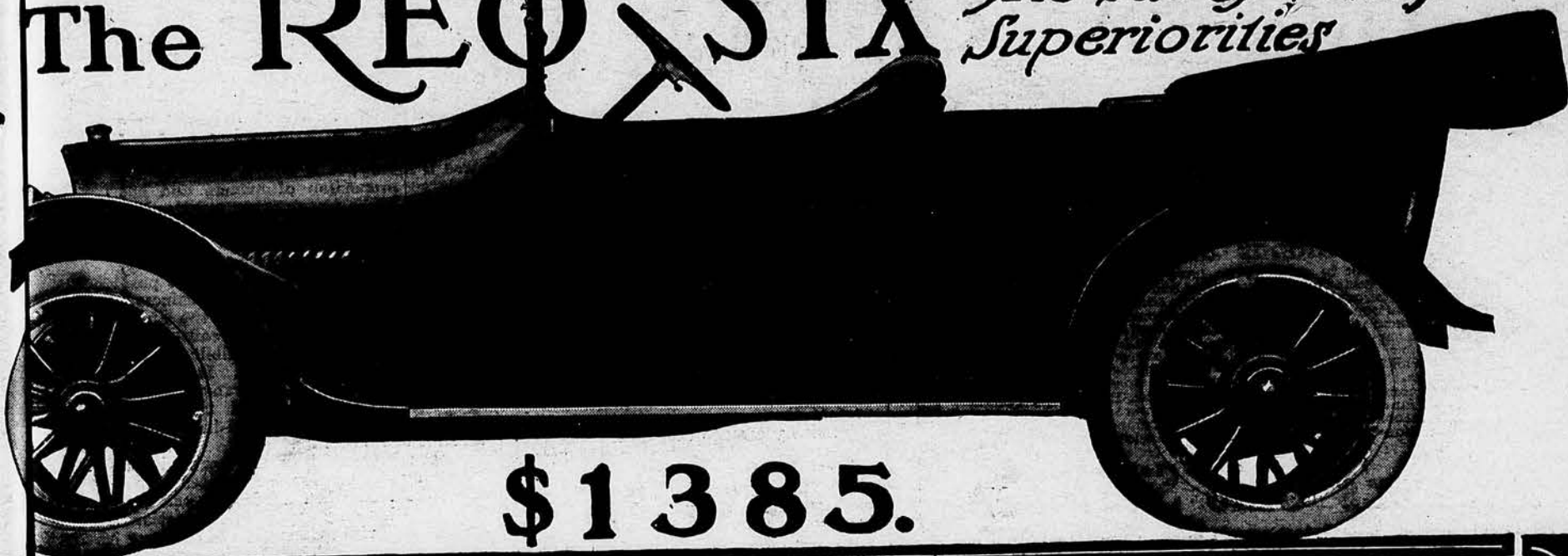
THEN IF IT BECAME NO—an order for steel in size for speaking, representative tw camping on the steps of nin please to the purchasing!

THAT CONDITION was m it existed. And only be we able to take instant adve o able to give you the pede pected—the unhoped-for es this ad.

WE HAD THE CASH—vn, stant without let or hind fro could declare another d— vastly greater advantage the We chose the latter cou

REO MOTOR CAR COMPANY

The REO SIX *The Six of Sixty Superiorities*



\$1385.

The Wonderful Values Possible in surmountable Obstacle is Golden Opportunity

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SO WE BOUGHT, and, paying the cash when cash
was at a premium, bought right. Bought better
than we had ever hoped—secured quality at prices
theretofore impossible. From tires to electric
starters—steel to leather—and hair—and paint.

THE WAR IS BENEFICIAL to those American
manufacturers who, like Reo, are alert to take ad-
vantage of it.

AND SO WE HAVE NO APOLOGIES to make
even to those friends to whom we sold 12,000 Reos
last season. Nor for a statement that we made in
the best of faith—and must now contradict in the
same good faith.

FOR IN GIVING OUR CUSTOMERS the full
benefit of the Reo purchasing power—instead of
retaining the former price and taking the addition-
al profit ourselves—we are only carrying out that
policy which, adhered to from the first, has placed
the Reo Motor Car Company in the splendid posi-
tion it occupies to-day.

SPEAKING OF POLICY—let us correct an im-
pression that we know is abroad.

OUR FRIENDS CRITICIZE US at times for what
they call our “ultra-conservatism.”

ABOUT THE ONLY COMPLAINT we ever hear
from Reo dealers is that we are too modest in
setting forth the merits of the Reo product.

WELL, PERHAPS THAT IS TRUE—if adherence
to the strict truth in our ads; if a determination
not to be carried away by the mania for mere
quantities; if we prefer to be second in numbers of
cars produced that we may be first in quality—if
these be indications of “ultra-conservatism”—why
then we plead guilty.

BUT OUR FRIENDLY CRITICS must concede
that that Conservative Reo policy has produced
tremendous results. Note the statement in the
third paragraph of this ad.

We DON'T CALL IT that, however. We call it
conservatism militant. Aggressive conservatism.
Alert conservatism. Being sure—absolutely sure
—we are right, then going ahead unfalteringly—
irresistibly.

DOESN'T THE VERY FACT that we were finan-
cially able to and did take advantage of a condition
that we knew was transitory; and the further fact
that, having bought better, we instantly offered
the better values to Reo buyers—doesn't that look
like “militant” rather than “ultra” conservatism?

WE THINK SO—and we leave the case in your
hands.

AN LANSING, MICHIGAN, U. S. A.

The Six of “Sixty Superiorities”

THIS SIX is sensational not be-
cause it is a six—but because it is
a Reo Six.

FOR REO WAS NOT one of the
first to embrace the “Six” idea.
Reo is one of the last.

REO WILL NEVER BE one of the
first to adopt any innovation—any
new—any unproven idea. For our
policy has ever been not to sell
ideas but automobiles. Depend-
able automobiles.

AND YOU WILL ALWAYS find
Reo “trailing” to just that extent.
We will never be one of those to
“take a chance”—with our cus-
tomers' money.

NOT UNTIL EVERY uncertain or
unknown quantity has become a
certainty will any new type of car
or motor or axle or part be offered
with the Reo name-plate.

SO YOU CAN ALWAYS BE
SURE—as you have in the past—
that in buying a Reo you are in-
vesting in no experiment.

THIS SIX IS THE RIPEST RE-
SULT of Reo engineering experi-
ence. The very fact that we make
and offer it to you is evidence
that the “Six” idea has now
passed the realm of uncertainty.

AND FURTHER, let us assure you
that every one of the sixty points
of superiority enumerated below
have been tried, proven—in fact
helped make the fame of Reo the
Fifth, “The Incomparable Four.”

THE “SIXTY”

(1) FLAT TYPE RADIATOR—
won't leak through freezing. Flat
tubes expand—don't fracture
under pressure of frost.

(2) RADIATOR DESIGN—curved
visor and graceful contour gives
class to the car. Costs more—
worth it.

(3) STREAMLINE HUB-CAPS
—original with Reo. Will be
copied.

(4) EXTRA HEAVY, one-piece,
forged front axle.

(5) TIMKEN BEARINGS (4) in
front hubs.

(6) REO CYLINDER DESIGN—
guarantees straight cylinders,
uniformity of water jackets—no
distorted cylinders—no scored
pistons.

(7) SAFETY—FIRST—and sure
—oil system.

(8) THREE-PIECE piston rings
—more power—quicker accelera-
tion.

(9) FIFTY PER CENT over-size
crankshaft. Ever hear of a Reo
crankshaft breaking? Never.

(10) EXTRA HEAVY cam shaft—
extra large cams. One reason
for silence and uniformity of
power in this Reo.

(11) ECCENTRIC fan-belt adjust-
ment.

(12) SPIRAL HALF-TIME gears.

(13) VALVE ACTION—roller lift-
ers. Some high priced cars still
have mushroom lifters. You
know the answer.

(14) OVERHEAD INTAKE
VALVE—not exhaust. Another
reason for greater power and
silence.

(15) FIBRE ROLLER tappets on
intake—another “silence” feature.

(16) VALVE ENCLOSURE—
silences, and keeps them silent
—see next paragraph.

(17) BREATHER TUBE exhausts
in valve enclosure—keeps parts
bathed in oil spray, and—

(18) NO OIL SPRAYED on out-
side of motor by breather tube,
eliminates most fruitful cause of
dirt accumulating.

(19) TWO FLEXIBLE JOINTS
between motor drive and gener-
ator. Most makers use one only.

(20) ADJUSTABLE main crank-
shaft bearings. Only motor made
in America in which main as
well as connecting rod bearings
can be adjusted without taking
motor out of car. No shims.
See the book.

(21) DUAL—injector type—ex-
haust manifold.

(22) WATER-HEATED INTAKE
manifold.

(23) REO STEERING gear—dif-
ferent and better.

(24) DRY DISC CLUTCH—no
tendency to drag. Saves gears,
axles, tires—and the driver's
temper.

(25) THREE-UNIT power plant.
Always was, always will be a Reo
feature. Only excuse for two-
unit idea is cheaper and easier for
maker—less accessible, more ex-
pensive to owner.

(26) FOUR universal joints—most
makers get along with one or two
—also at the buyer's expense!

(27) BRAKE AND CLUTCH control
system—only one hand-lever.

(28) REO ONE-ROD CONTROL
—simplest ever devised.

(29) REO GEAR-SHIFT—direct
connected lever—you feel the
gears as if your fingers touched
them. “It's a pleasure to shift
gears.”

(30) REO patented locking device
—impossible for two gears to
mesh at once.

(31) HYATT bearings in transmis-
sion.

(32) “INDEX” PLATE surround-
ing control rod—“a novice could
drive.”

(33) FULL FLOATING rear axle.

(34) TIMKEN bearings in rear
axle.

(35) NEW TYPE torque-arm.

(36) WORM BEVEL driving gears
—see the book.

(37) CANTILEVER rear springs.

(38) RIGID attachment of canti-
lever springs to axle.

(39) REMY electric starter and
lighting. Made like the car—to
stay good.

(40) STARTER hook-up—exclu-
sively Reo. Worm drive. No
shifting gears—no over-running
ratchets.

(41) STARTER LEVER—handy,
but unobtrusive—you touch it
only when you want to.

(42) TIRE PUMP attached to
main driving shaft.

(43) DIMMING attachment to
headlights.

(44) PILOT LIGHT and tail light
connected in series.

(45) SPECIAL tail-light switch.

(46) PRACTICALLY one-piece
pressed steel cowl. Pressed steel
body on wood frame—so made it
can't spring “a creak.”

(47) 6 1/2-INCH WIDER tonneau.

(48) 50 PER CENT OVER-SIZE
in all vital parts—the Reo factor
of safety.

(49) REO ACCURACY—Reo care
Reo inspection everywhere.
Parts ground to absolute exact-
ness.

(50) 190-ODD STEEL FORGINGS
—in many places where others
think castings good enough.

(51) REAL LEATHER upholstery-
ing—we've never found any sub-
stitute that was “just as good.”

(52) REAL HAIR—retains its
spring.

(53) REAL RUBBER and Sea Is-
land cotton in tires—not cheese-
cloth and Jersey clay.

(54) VENTILATING, rain-vision,
clear-vision windshield and at-
tached to stay put.

(55) WINDSHIELD and top sup-
port—have to study in detail to
fully appreciate.

(56) GENUINE one-man top. Five
bow type.

(57) LIGHTER weight in propor-
tion to power—result of using
better materials.

(58) EVERY PART—radiator-cap
to tail light—Reo made and Reo
guaranteed.

(59) MOST ACCESSIBLE car in
the world. Adjustment can be
made to any unit without dis-
turbance to any other.

(60) FINALLY—and most impor-
tant to you, the Reo name-plate
—signifies that the Reo guaran-
tees with all it stands for in
integrity and financial stability,
goes with the car.

DELIVERIES will begin about
January 1. Only way to be sure
of getting yours early is to order
now. See your local dealer.

New Edition Just Out



Send for the New Edition of This Famous 264 Page Book

It's far superior to anything we have ever put out before. Tells everything you want to know about silos and silage. Home made silos—hoop and octagonal silos, pit silos, brick, concrete, tile, cement, metal—all modifications of all known types. We do not make silos, therefore, can recommend without favor. When you read this book you can make an unerring choice of the best type of silo suited for your particular needs. Your climate—your conditions—your stock—your land—your crops—are all fully discussed and best suggestions offered for increasing your profits. Copyrighted November, 1914. Contains 30 page Feeders' Guide and complete 10 page Index, 56 illustrations. Be sure to get this new copy. It's far ahead of former editions which were used as text books in agricultural colleges. We send it for 10 cents, stamps or coin. Send for this revised edition—read it and profit from the knowledge you will get from it.

Silver's "Ohio" Silo Fillers

have for years made the best records for big capacity, fast work and low operating cost. Let us tell you about our new model by sending you catalog and our free booklet, "Silo Filler Logic." Write today for these two books. Enclose 10 cents and receive the new edition of "Modern Silage Methods" with them.

The Silver Mfg. Co.
352 Broadway
Salem, O.

FORD OWNERS

Make Your Own Good Roads

By equipping your car with genuine

K. W. Road Smoothers

\$15.00 per set, and satisfaction guaranteed by refunding money if you want. Write now for more free information while you have our address before you.
KANSAS CITY AUTOMOBILE SUPPLY CO. Kansas City, Mo.



PACKARD EXTRA QUALITY TIRES

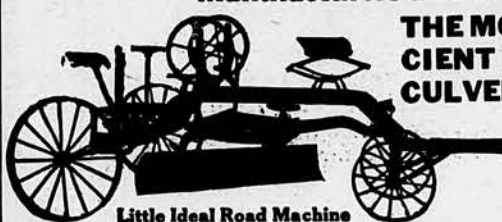
Give better service than other standard makes because Packards are made of better material. They carry 4,000-mile legal binding guarantee, but according to reports from users usually run twice that distance. Where we have no exclusive agent or dealer we will allow you **WHOLE-SALE DISCOUNT**. Write Dept. K for prices. We sell Standard Auto Supplies at reduced prices with guarantee of "Satisfaction or Your Money Back." We issue regular catalogue, also special catalogue, "Supplies for Ford Cars." Both free.

Western Auto Supply Agency, Dept. K, Kansas City, Mo.

THE GALION IRON WORKS & MFG. CO.

Manufacturers and Distributors of

THE MOST MODERN and EFFICIENT ROAD MACHINERY and CULVERT PIPE in the WORLD.



Little Ideal Road Machine

Gallion Ideal Cast Iron Culverts

possess every desirable culvert feature—greatest strength—capacity—durability and economy.

Gallion Ideal Cast Iron Culvert—The Strongest Culvert in the World.

Repair Your Road Graders

With Gallion Blades. Made of highest-grade blade steel. Every blade fully guaranteed

Cutting Edges for All Makes of Graders.

WE HAVE ESTABLISHED A DIRECT FACTORY BRANCH AT WICHITA. YOUR COMMUNICATIONS SENT TO THIS OFFICE WILL RECEIVE PROMPT AND PERSONAL ATTENTION.

We manufacture and distribute, direct to you, Modern Road Graders, Road Drags, Scarifiers, Road Rollers, Tractors, Stone Unloaders, Gravel Screening Plants, Rock Crushers, Scrapers, Road Plows, Elevators, Screens, Bins, Street Sprinklers, Flushers, etc.—everything for builders of good roads. **BUY DIRECT FROM US AND YOU SAVE MONEY.**

Fill in the blank. Let us know which of the above articles you are interested in and we will send you complete information, prices, etc.

THE GALION IRON WORKS & MFG. CO., Kansas Branch, 305 Bank of Commerce Bldg., Wichita.
Home Office and Works, Galion, Ohio. Oklahoma Branch, Enid, Okla.

Send complete information regarding.....

Name.....

Full Address

Motor Car Utility Certain

From an Article by A. L. Gale, in Agricultural Advertising

IN 1902, when the automobile industry was in its infant's clothes, the man who bought a car was the object of immediate suspicion. The neighbors worried terribly—fearing that he was going at a faster clip than his bank account could stand.

Today the question, "Can he afford it?" is not asked nearly so often as it was, and in the case of the farmer, the merchant, the professional man—of any individual, in fact, with whom the matter of getting there and back quickly is an important factor in the performance of the daily task—the question, "Can he afford to be without it?" more often applies.

I know of no more forceful demonstration of the fact that this is the day of the motor vehicle than we find in the war-ridden countries of Europe at the present time.

Twelve years ago they called the gasoline car a plaything. Today that "plaything" is doing the work of prancing steeds in carrying stiff-backed officers back and forth along the battle line; is transporting ammunition and food supplies from base to front for distances unheard of in other wars; is serving as a veritable battleship on wheels, from which squads of gunners operate their rapid-fire pieces; is bearing nurses and surgeons and wounded so swiftly that

of the Dime Savings Bank—who, in an address to the bankers of the country at Richmond last month, said:

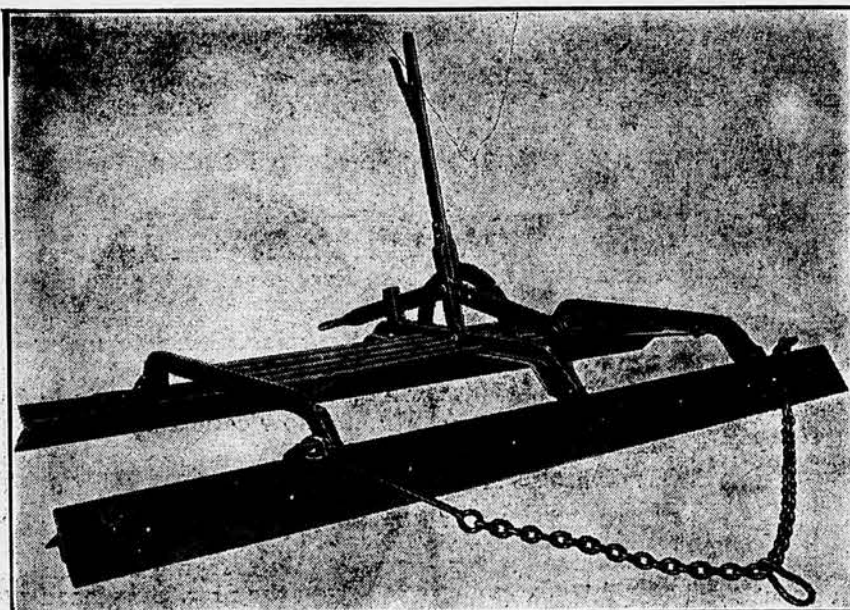
"It is worthy of note that at no time in twelve years has the industry as a whole taken a backward step. * * *

While in the early days the automobile was a luxury, it is now a necessity for a large proportion of owners and has taken its place among other utilities like the telephone and telegraph. * * * It must be appreciated that to the farmers, doctors, and business men generally, the automobile is now a dependent part of their equipment for doing business."

As a developing influence, the automobile has brought good roads—with their wealth-producing possibilities for farmer and city man alike. It has increased the efficiency of transportation so that farm profits and mercantile profits have shown a marked increase as a result of its coming.

It has broadened the farmer's vision by taking him out of the restricted paths which he trod when his horses and his legs were his only means of locomotion. It has made rich farmers out of ordinary ones. It has multiplied efficiency and promoted the general welfare * * *

Take good care of this cause of The Car! It pays, as a concrete proposition. It pays in the broader sense, because it is making us a happier people—better



ADJUSTABLE STEEL ROAD DRAG — THE BEST TYPE OF DRAGGING IMPLEMENT YET DEvised

the death rate is amazingly low, considering the size of the contending forces.

This is a grim and ghastly comparison of efficiency values, I grant you. But it is justified in showing how the thing which we treated so lightly but a little more than a decade ago is now the most important of all utilities in the greatest contest the world has ever known.

And surely modern warfare—to be successful—must be efficiently waged; surely the principal means of transportation in a campaign which has for its chief purpose nothing less than a re-making of the maps, is one that can be employed with equal efficiency in doing the constructive work of peace.

My friend Pierce says this is the day of the automobile, in peace and in war. He is right. It is the fighter's indispensable tool. It is the farmer's friend. It is the economical means of prosecuting the enterprises of a busy world—even when half of the world is busy at the task of murder while the other half is busy at the task of lifting itself to greater heights.

Some good always comes out of evil. From the monumental crimes of this war good has come in various ways, and one of the evidences of resulting benefit is this deification of that wonder of the age which we call The Car!

For proof of the fact that, as a peaceful instrument and an article of necessity in the world of business, the automobile had "arrived" long before this war began, let us go to the banker himself—the man behind the industry from the financial standpoint.

If there are bankers who know the value of the automobile as a commercial utility, those bankers must live in the city of Detroit. And it was a Detroit banker—William Livingstone, president

informed, better qualified to make money, more efficient in the doing of the world's work.

Tractor Better Than Horses.

A tractor is far superior to horses for road work. The tractor does better work and at less cost. Depending on the size of the tractor, it easily will replace fifteen to thirty sturdy horses in road construction work, and cover more ground at far less expense and with much better results. The operator can handle and guide a tractor with greater ease than an equivalent number of horses required to do the same amount of work. It also is possible to start the tractor more gently and work at a faster, steadier pace than with horses. Then, too, the tractor exerts sure, continuous power at all times and even on sharp turns travels along with the same consistent speed and power. This is not true, however, of a team of eight or ten horses engaged in road-building work. More often than not they furnish inadequate, unreliable power, and when the work is especially hard require frequent rests, involving considerable loss of time. Weather and soil conditions that often necessitate a lay-off when operating with horses do not hamper the work of the tractor.

Get Road-Making on Business Basis.

The roads are public property. The condition of the roads affect everybody in economic, social and moral ways. It costs four-fifths of one cent per mile per ton for railroad shipment and on an average twenty-five cents per mile to haul a ton of farm produce for one mile. Why not put road-making on a business basis and get results?—J. H. MILLER, Director of Extension, Kansas State Agricultural College.

CULVERT CONSTRUCTION

Principles of Road Drainage—By Benjamin Brooks

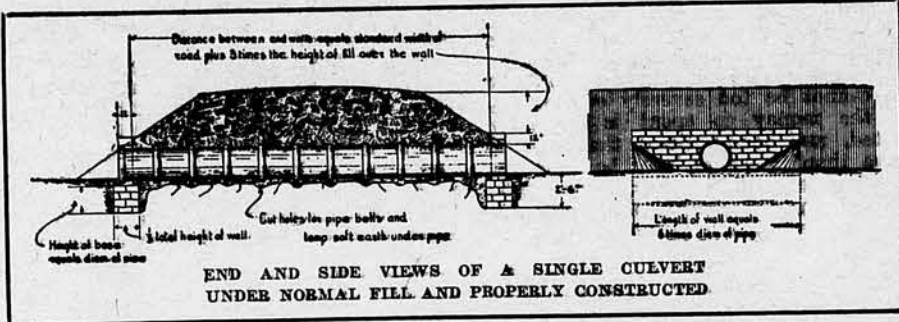
THE most important part of a good permanent modern highway is the water that doesn't stand on it. This is simply a homely back-handed way of saying that the science of road building as practiced by the best engineers is really not so much a matter of piling up dirt and surfacing it with rock or other material as it is a matter of handling water. A road proposition is a drainage proposition, and a road is simply a means of keeping out of the mud as we go about our daily task of transportation.

The justly famous road drag has dem-

walls can be fixed once for all in terms of the pipe diameter—the length six times the diameter, the width one-third the height, and so on according to a diagram like the following:

Foremen should see to bedding the pipe evenly on the natural stream bed, cutting holes for the sockets, about tamping earth snugly down on each side of it, and about carrying the head walls deep enough to be a protection for the culvert.

Under this system there is no reason why the best vitrified-pipe culvert should not also be the cheapest—by all odds the



onstrated what can be done with plain dirt by scraping the humps out of a road surface so it can shed rain, and dry with a smooth hard crust. Both the road drag and the bridge are recognitions of the importance of the old problem of drainage in connection with road building. But the countless little culverts—which are bridges, too—are important in road drainage.

Culverts have generally been installed by road men who had no appreciation of road drainage but thought merely of the road surface, which is the least part of it. If a road crossed a stream and there was not room for a culvert between the road surface and the stream bed, they buried the culvert so that it would surely fill with mud and be useless, instead of elevating the road to let the culvert pass under it on the natural stream level. They have not realized that all the railroads on the continent have been built without intentionally interrupting a single streamlet, and that for wagon roads the same rule should apply, and water

cheapest in the long run—and no reason why the main problem of road drainage should not be as near perfect as that is possible.

Narrow and Wide Tires.

The general use of wide tires on road wagons would contribute much to the maintenance of good roads. Narrow tires are not only destructive to dirt roads but to all road construction other than the very best of pavement. Many wagons with ten-inch tires are used in Illinois, but those with four-inch tires are in most common use. No load with less than four-inch wheels is allowed upon the road between Omaha and Florence, Neb. The wide tires help pack and smooth the road, while the narrow tires cut up the surface and make ruts.



TYPICAL DOUBLE VITRIFIED PIPE CULVERT WITH BULKHEAD OF FIELD STONES

should always have the right of way.

Vitrified clay pipe has been used for drainage purposes now for seven thousand years. It is the simplest possible means of securing permanent good drainage for a permanent good road. If it needs a concrete foundation in a boggy place or a protecting slab over it in a shallow place it makes its own form on which there is no wear and tear and upkeep. If it is used alone, as in ninety-nine cases in a hundred, it requires the least inspection and supervision. As to using it in an engineering way, just as we use a 100-foot span—that can very readily be done by having one engineer design not one culvert but a whole series of culverts, all in proportion to the streams they carry.

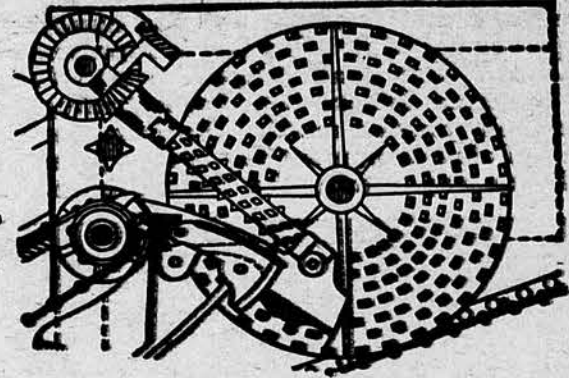
The road engineer obtains first the area which each stream drains in crossing his road. According to the rule adopted by the Santa Fe Railroad, each square mile of land draining into a stream requires 100 square feet in the cross section of the culverts. Thus, one 12-inch clay pipe will drain five acres; 15-inch pipe, eight acres; 18-inch pipe, 11 acres; 21-inch pipe, 15 acres; 24-inch pipe, 20 acres; 27-inch pipe, 25 acres; 30-inch pipe, 31 acres; 36-inch pipe, 45 acres.

Since a road embankment gets three feet wider at the bottom for each foot it rises, these heights will give culvert lengths. The dimensions of the road

More than a Corn Sheller

Sectional view of shelling cylinder, rag iron and picker wheel.

Note that the ears are shelled at the iron and not from the end.



WHEN your corn is ready for shelling you want to be sure that you are going to get all your corn to sell and get top price for it. What you must have, then, is a machine that not only shells the corn, but that cleans it, that does not crack kernels or break cobs, and that will do a clean job of shelling on damp corn.

The corn sheller that does all these things is the Keystone, sold by F H C dealers. Its good qualities are largely due to the effective shelling device shown above and also to the unique chain and fan blast cleaning arrangement.

Keystone corn shellers are made in all sizes from the 1-hole wood or steel hand power machine to 2, 4 and 6-hole shellers with capacities of 1,000 to 4,000 bushels a day. These large shellers are furnished mounted on trucks; unmounted, to be used on trucks you already have; or down, for use as stationary machines.

Keystone shellers can be set conveniently to any crib; they fold into small compass for storage or transportation; they hold records for continuous years of good service.

Before you decide on that new sheller, write to us for full information about the Keystone. We will tell you where you can see the machines before you buy.

International Harvester Company of America
(Incorporated)

CHICAGO

Champion Deering McCormick Milwaukee Osborne Plano

USA

READ KANSAS FARMER'S CLASSIFIED ADVERTISING PAGE FOR READY BARGAINS

Will there be a Victrola in your home this Christmas?

You can search the whole world over and not find another gift that will bring so much pleasure to every member of the family.

Any Victor dealer in any city in the world will gladly demonstrate the Victrola and play any music you wish to hear. Write today for illustrated catalogs.

\$15 \$25 \$40 \$50
\$75 \$100 \$150 \$200

Victor Talking Machine Co., Camden, N. J., U. S. A.

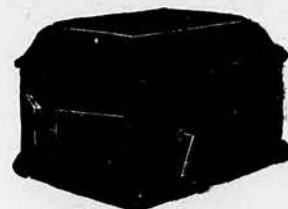
Berliner Gramophone Co., Montreal, Canadian Distributors

Always use Victor Machines with Victor Records and Victor Needles—the combination. There is no other way to get the unequalled Victor tone.

New Victor Records demonstrated at all dealers on the 28th of each month



Victrola IV, \$15
Oak



Victrola VIII, \$40
Oak



Victrola X, \$75
Mahogany or oak

Victrola XVI, \$200
Mahogany or oak

MAKING GOOD ROADS

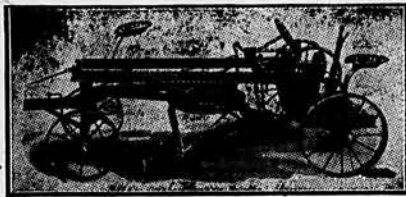
Is largely a matter of buying good equipment and making the proper use of it. Our line is represented in every part of Kansas. Our Road Drags, Culverts, Graders, Scrapers, and Concrete Mixers are demonstrating to hundreds of users their genuine merit. We have been specializing in road building equipment for twelve years. In buying our goods you pay nothing for this experience.

Armco American Ingot Iron Corrugated Culverts

Made from pure iron. Tough, reliable, elastic, adapted to difficult places. Properly installed, they never fail. The unequalled rust resistance of this material is one of the triumphs of modern science. The culvert with an unequalled record. Has never failed to give satisfaction. The United States Government specifies American Ingot Iron for culverts.

OUR LINE OF ROAD GRADERS

The Russell Elevating Grader for traction engine, 16 horses.
The Russell Mogul Grader, 12-foot blade for traction engine.



Traction Special Grader, 8-foot blade, for traction engine or 12 horses.
Russell Standard Grader, 7-foot blade, for 8 horses.
Russell Junior Grader, 6-foot blade, for 4 horses.
Russell Simplex Grader, 7-foot blade for 4 horses.
Russell Kid Grader for 2 horses.

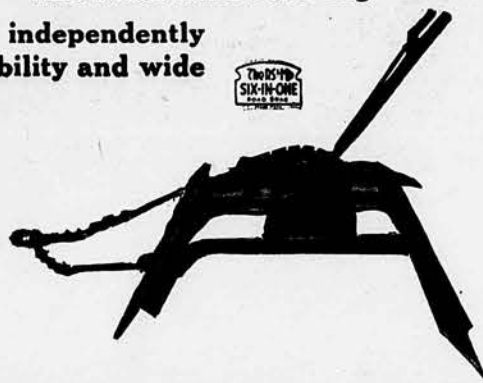
WE HAVE THE ROAD GRADER YOU NEED

A FREE TRIAL OF ANY GRADER

THE R. S. & M. SIX-IN-ONE ALL STEEL ROAD DRAG.

Six Different Adjustments of Blades. Six Drags in One. The Most Modern Drag.

Each blade adjusts independently of the others. The flexibility and wide range of adjustment enables the driver to accomplish any kind of road work. This drag is superior in efficiency to anything on the market. It is strong, durable and efficient.



REPAIR YOUR GRADERS WITH OUR BLADES OF FINEST STEEL

High-Grade Steel properly tempered, carefully polished and blued, and made to fit, are the qualifications of our cutting edges. When in need of a grader blade, or cutting edge, you want a blade of the best material and one that will fit. We furnish grader blades for any make grader, not only those shown, but also any obsolete pattern. We carry a full stock. Simply give us the name of your grader and we will do the rest.

We Guarantee Satisfaction

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WRITE FOR OUR BIG NEW CATALOG.

In submitting our line of goods to our customers, composed in large part of the Township and County Boards, City Councils, Good Roads Organizations, and not infrequently individual customers, we do so with the implied mutual understanding that our goods must give satisfaction or we will take them back. This basis of honest dealing and square and fair treatment has gained a constantly increasing business for us and we have found it necessary to enlarge our facilities to the extent of installing a factory at Hutchinson, Kansas, and we are in better position than ever to make prompt shipments.

ROAD SUPPLY & METAL CO.
Hutchinson, Kans. Topeka, Kans.

BUILDING DIRT ROADS

Information Leading to Economical and Satisfactory Construction

It is very obvious from only a casual inspection of many of the roads that little attention is given them at the proper time. Kansas roads are quite generally worked when the spirit moves the overseers. Reports show that 38 per cent of the work is done in the spring, 18 per cent in the summer, and 44 per cent from October to January. The state statute on this subject says that "the county engineer and the road commissioner shall determine when the road work shall be done, but all general work of constructing and maintaining roads shall be done and performed between the first day of April and the first day of October each year, except such work as may be necessary in repairing the roads to keep them safe for travel or such repairs as call for immediate attention."

The practice of grading roads in the fall cannot be too severely condemned, for the money so spent is generally wasted, and many times the road is worse than it would have been had it not been touched, for there is not sufficient length of time after the grading is done to permit the loose earth to be compacted before winter sets in.

The work must be done when the ground is wet enough to work and compact well and form a good wearing surface. This can best be done by grading before August 1 and the sooner after April 1 the better, while the ground is loose and the roots of the grass and weeds do not interfere.

USE OF THE PLOW.

A plow should not be used in working an earth road except when actually necessary, because a plowed surface is difficult to make smooth and hard and it cuts too deep in many places, and especially in the holes where it should be

there is always more or less contention about the amount of work the different teams are doing; and one expert grader is all that is needed to do first-class work. The extra man is only in the way.

HARROW A GOOD ROAD IMPLEMENT.

For the newly-graded earth road that contains no sod, an ordinary straight steel-toothed harrow is one of the very best machines that can be used to settle the loose earth and level off the bumps and fill up the holes. On roads where sod and lumps of tough earth have been graded up a disk harrow should be used to thoroughly cut them up, and it should be followed by a road drag or a straight-tooth harrow to level and settle the loose material.

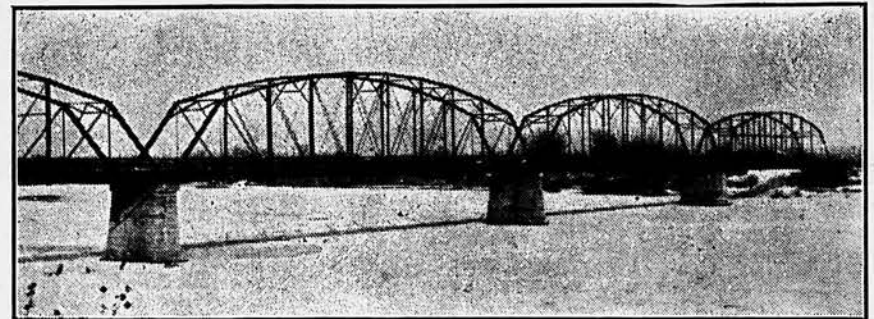
ROLLER IS AN ESSENTIAL.

The value of a roller in the construction of earth roads is very little appreciated. It is just as important to have the surface of an earth road solid and well compacted as it is a gravel or stone road.

It would probably not be advisable in many of the townships in Kansas to buy an expensive roller, but a very satisfactory roller can be made of concrete, weighing about four tons and costing not to exceed \$60.

HOW TO GRADE AN EARTH ROAD.

In building new roads with a road grader the dead weeds and grass should first be burned off before any grading work is done, and the width of the road to be graded should be staked so the ditches can be properly lined up; then plow a light furrow with the point of the grader blade, carrying the rear end of the blade well elevated. On the second round drive the wheels in line with the point along the hollow made the



ST. MARYS BRIDGE—BEST STEEL BRIDGE ON THE KAW RIVER WEST OF KANSAS CITY.

cut the least. This leaves the surface full of depressions and soft spots which have no place in a road.

DRAGS OR SCOOP SCRAPERS.

The drag or scoop scrapers, commonly known as "slips," should not be used where the haul is over 150 feet, for there are other devices which are much more economical; but for side work and filling holes on short hauls they are very satisfactory.

WHEELED SCRAPERS.

Wheel scraper, size No. 2, is very much more satisfactory than other sizes. The maximum economical haul with a wheeler is about 400 feet. Any of the standard makes will give good results, but do not buy too many special attachments and adjustments.

ROAD MACHINE IS GOOD.

The road machine is commonly known as the road grader or reversible grader. The difference between the results obtained by the use of a road machine and by the use of the old-fashioned plow-and-shovel method is clearly defined. A road machine of recognized merit will plow where an ordinary plow will not enter the soil. Besides, it will distribute the earth evenly and leave the road smooth without any of those little bumps and holes which characterize the road made or repaired in the old-fashioned manner.

The four-horse graders will generally prove unsatisfactory except for doing very light grading work or cleaning ditches. There is entirely too much money being invested in these light machines by townships that can only afford one machine to do all their work. If only one or two machines can be had it will be very much more economical and satisfactory to get a good big strong reversible grader of some standard make.

Only two men are necessary to operate a road grader, for one experienced man can drive three or four teams very much better than several drivers could, for when there is a driver with each team

first round, plowing a full furrow with the advance end of the blade, dropping the rear end somewhat lower than before. The third time move over toward the middle of the road the earth previously plowed, then return to the ditch and plow it out deeper, moving the earth toward the middle whenever as much earth is plowed as the machine can move at once. Repeat this process until the ditches are the proper depth, and then cut off the outside slopes of the ditches by placing one wheel of the grader in the bottom of the ditch and the other one on the bank. This can be done very easily if the bank is not more than thirty inches above the bottom of the ditch. Then fill the road full and round and thoroughly harrow the loose material with an ordinary straight-tooth harrow if there are no clods, going over it until the bumps have been leveled off and the low places filled up and the material well compacted. If there are sods or tough lumps of earth in the road, a disk harrow should be used to pulverize this material and the harrow should be followed by a King drag or a straight-tooth harrow to level and smooth the earth. No newly-graded earth road can be finished in good shape without using either the harrow or the drag, or both. A roller should follow the harrowing to compact the earth. It will reveal the soft spots and new material can be placed in these and the whole surface brought to a smooth, even, uniform cross-section. By thoroughly compacting the earth and removing the small depressions the road will not rut nearly so readily, and the heavy rains will not form great gullies, as is often seen on newly-graded roads after a heavy rain-storm.

In repairing a road previously constructed, commence at the side ditches and work toward the center, scraping lightly with the entire length of the blade, until the last round in the middle

(Continued on page eighteen)

HOME CIRCLE



When washing sateen, use borax water, as this will restore the gloss to the goods.

Fine gingham and percales, if dipped into sweet milk instead of starch, will have the dainty glossy appearance they have when new.

When darning, especially where a stitch has been dropped, work diagonally across the weave, and the stitches are less likely to pull away from the edges of the mended place.

When making the holes for eyelet embroidery, hold a piece of white soap behind the work and let the stiletto go into the soap. This will give a slight stiffness to the material which will hold the threads in place, thus insuring a more perfect eyelet.

A clever way to restore a worn-out drawnwork lunch cloth or doily is to sew a strip of lace insertion over the drawn-

work. Providing the linen is in good condition, this simple method will give much additional service.

Lemons will yield about twice as much juice and flavor if they are allowed to stand for a few minutes in hot water. This is especially true if the lemons are somewhat dry and hard. If you are wanting to use just a very little of the juice for flavoring, instead of cutting the lemon in two, pierce it with the prongs of a fork and squeeze out the desired amount, and the holes will close up, leaving the fruit in good condition. In this way there is not any waste.

Apple Marshmallow Pie.

Line a pie tin with a good rich pastry. Fill with thinly sliced apples and sprinkle with sugar and bits of butter. Add a quarter of a cupful of milk and a little grated nutmeg. Bake until the pastry is crisp and the apples sufficiently done, then put a layer of fresh marshmallows over the top and serve as soon as the marshmallows are melted.

FASHION DEPARTMENT — ALL PATTERNS TEN CENTS

This department is prepared especially in New York City for Kansas Farmer. We can supply our readers with high-grade, perfect-fitting, seam-allowing patterns at 10 cents each, postage prepaid. Full directions for making, as well as the amount of material required, accompanies each pattern. When ordering all you have to do is to write your name and address plainly, give the correct number and size of each pattern you want, and enclose 10 cents for each number. We agree to fill all orders promptly and guarantee safe delivery. Special offer: To anyone ordering a pattern we will send the latest issue of our fashion book, "Every Woman Her Own Dress-maker," for only 2 cents; send 12 cents for pattern and book. Price of book if ordered without pattern, 5 cents. Address all orders for patterns or books to Kansas Farmer, Topeka, Kansas.



No. 6983—Ladies' Dress: Very simple, this frock is also very distinguished in style. It has loose sleeves cut in one with the side bodies and a center front and back in jacket effect. There is a flare collar at the neck. The one-piece circular skirt is quite full at the lower edge. The pattern, No. 6983, is cut in sizes 34 to 44 inches bust measure. No. 6989—Ladies' Overblouse: Two separate designs are offered in this pattern. In style 1, the jacket effect is used, with tab extensions at the front and back, open neck, flare collar and front closing. In style 2, the blouse is more of a waist, with deep open neck in front and high bottomed back. The pattern, No. 6989, is cut in sizes small, medium and large. No. 6984—Ladies' House Dress: Altogether plain and practical, this frock has a bodice which closes in the center of the front and ends at the neck in a small turnover collar. The bishop sleeves may be full length or shorter as preferred. The seven-gore skirt closes at the side of the front. The pattern, No. 6984, is cut in sizes 34 to 44 inches bust measure. No. 6971—Child's Dress: This smart little frock has a diagonal closing in front, with open neck edged with wide ornamental collar and filled in by a small shield. The sleeves, joined to a drop shoulder, may be long or short and are in bishop style. The pattern, No. 6971, is cut in sizes 4, 6 and 8 years. No. 6964—Ladies' Skirt: This smart circular skirt has a two-gore foundation and the lower section is joined to this. The two-piece tunic is fitted at the top but flares at the lower edge. This has a square extension in front reaching the hem of the skirt. The pattern, No. 6964, is cut in sizes 22 to 32 inches waist measure. No. 6973—Girls' Coat: This model offers the simplest form of the raglan. It has a double-breasted closing, which may be carried close to the throat or open a little, the edges trimmed with the usual small coat collar and revers. The pattern, No. 6973, is cut in sizes 4 to 14 years.



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When writing to advertisers, please mention Kansas Farmer.

POULTRY



All signs point to an open winter this year. This means an early start in hatching chickens in the spring.

But in order to take advantage of the early start, you must have an incubator, so that you can raise the cockerels to broiler size in the best paying season and raise early pullets so as to have them start to laying in the fall.

Entries for the Central Kansas Poultry Association Show, held at Newton, Kan., December 14-20, close noon Monday, December 14. E. R. Sanner, Newton, is secretary, to whom all exhibits should be shipped.

The incubator manufacturers are just getting out their catalogs at this time of the year, and are anxious that you should get one so as to be able to choose the machine that you will need for next season. As soon as you decide on the incubator that you want, send off and get it. Don't wait till the busy season is on, for then the manufacturers are rushed to death and sometimes are compelled to hold an order for some time because it is absolutely impossible to fill it at that time; whereas if you send for the machine before the rush season is on, they can send you a good machine that is well seasoned and in perfect running order.

What is believed to be the record egg yield of any domestic fowl was recently completed by an Indian Runner duck owned by John Slade, of Malvern, Pa. This duck commenced to lay at the age of five months and two days and laid 358 eggs in 365 days from October 6, 1913, to October 5, 1914. This is laying an egg for every day in the year, lacking seven days. For one period she laid 143 eggs in 143 days. This record is subscribed and sworn to by the owner and manager of the poultry yard that owns the duck. That it is worthy of belief is shown by the fact that Indian Runners excelled all other domestic fowls in egg competitions held in Australia. One Australian produced a pen of these ducks that averaged 320 eggs in 365 days. That being the average of the whole pen, it is certain that some of them laid more than 320, and of course some under that number.

The Department of Poultry Husbandry of Cornell College has recently been doing great work among the farmers of New York State by picking out and

eliminating the poor layers from among their flocks of poultry. Frequently from 25 to 50 per cent of the hens have been discarded without reducing the total daily egg yield. The birds that were eliminated were robber hens, because they reduced the profits from the remainder of the flock, which would have required less labor, less feed and less house room. The time to select hens for breeding purposes is in the fall rather than in the spring. At this time only the more productive individuals are laying, and the characteristics that distinguish the productive from the unproductive are more easily seen. These characteristics are the condition of the molt, the shape of the body, the size and color of the comb, the color of the shanks and the actions of the birds. When farmers fully realize these facts, a great many more robber hens will be used for Sunday dinners.

Poultry experts are of the opinion that the European war is going to affect the prices of poultry and eggs in this country, and advise the poultrymen to raise all the chickens they can so as to have plenty of eggs to sell as well as a surplus of poultry. They say that it is a well known fact that England depends largely on continental Europe and some of her colonies for her egg supply, and as the poultry business is ruined in Belgium and large portions of France, Germany, Austria and Russia, and the price of eggs in Holland, Denmark, Norway and Sweden is beyond the reach of ordinary people, her egg supply will be cut very short. In fact all continental Europe will suffer in this respect, unless it is Russia. This is greatly to be deplored, as large quantities of eggs will be needed for hospitals and convalescent soldiers. We believe the price of eggs will be very high, not only for the coming season but for two or three years to come, because it will take considerable time for those countries to get their poultry work back to normal conditions. Hence all poultrymen should put forth extra efforts to increase the supply of poultry and eggs.

Kansas State Poultry Show.

The twenty-sixth annual exposition of the Kansas State Poultry Association will be held at Wichita, January 11 to 16, 1915. The premium lists are now ready for distribution and a copy can be procured by sending a postal to the secretary, L. B. McCausland, Wichita, Kan. The premiums offered are very liberal, with the small entry fee of 35 cents a bird or \$1.75 for a pen of five birds.

Kansas Panama Pacific Building



THE Kansas State Building at the Panama-Pacific Exposition at San Francisco is now receiving its interior finishing coats, and will be ready for its furnishings some time this month. The building is strictly classical-colonial in its lines, and many of the well informed who have seen it speak of it as one of the cleanest types of architecture on the exposition grounds. The main building is fifty by one hundred feet, with two large verandas on the east and west. The furniture and furnishings have been contracted and are being made with special reference to the general architectural scheme. The Kansas building will be truly a club building and resting place for visiting Kansans and their friends. It faces south on the Avenue of Nations. Back of it is the Golden Gate, with the Alcatraz Islands a little to the east. The construction is stucco, and the cost will be about \$21,000.

Mrs. Effie Van Tuyl, of Leavenworth, Kan., has been selected as hostess. The Kansas Commission to both the San Francisco and San Diego Expositions are Albert T. Reid, Topeka, Kan., president; Senator W. F. Benson, El Dorado, Kan.; Walter P. Innes, Wichita, Kan.; J. L. Pettyjohn, Olathe, Kan.; H. E. Dean, Kansas City, Kan., secretary.

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We want one person in each locality to whom we can refer new customers. Take advantage of our SPECIAL FREE TRIAL OFFER. Write today. AGENTS WANTED.

SUNSHINE SAFETY LAMP CO.

222 Factory Bldg., Kansas City, Mo.

SICK HOGS

Sick hog troubles stopped and prevented. Worms destroyed, cough and thumps stopped and hogs restored to thrift. Most effective remedy known. Its action is quick. Treatment simple, any farmer can use it. \$5 case treats 40 hogs. Agents wanted. Book and particulars free.

DR. D. C. SNODDY CO., Nashville, Tenn.

ALFALFA SEED WANTED

Send sample and price to

O. M. SCOTT & SON, MARYSVILLE, OHIO,
16 Main Street.

Don't fail to read Kansas Farmer Classified Advertising Page. It is filled with bargains every week.

PURE BRED POULTRY**TURKEYS**

WHITE HOLLAND TURKEYS, \$3 AND \$4. Chas. Vorles, Wathena, Kan.

BOURBON RED TURKEYS FOR SALE. V. E. DeGeer, Deerhead, Kan.

NARRAGANSETT TURKEYS—TOMS, \$5. Mrs. Ripley Smith, Cleveland, Mo.

WHITE HOLLAND TURKEYS, FAWN White Runners. Zella Stewart, Hollis, Kan.

BOURBON RED TURKEYS FOR SALE, none better, by C. S. Hart & Sons, Milan, Mo.

BRONZE TURKEYS, LARGE TYPE, from 40-pound tom. Fay French, Jamestown, Kan.

BARGAINS, PURE-BRED BRONZE turkeys. Write. Mrs. T. H. Gaughan, Earlton, Kan.

NARRAGANSETT TURKEYS—BREEDING stock unrelated. Sarver's Poultry Farm, Mt. Moriah, Mo.

PURE-BRED MAMMOTH BRONZE TUR- keys for sale. Mrs. Wm. Foster, Morehead, Kan.

PURE-BRED M. B. TURKEYS—LARGE bone, vigorous and healthy. Also Indian Runner drakes. Sadie Litton, Peabody, Kan.

MAMMOTH BRONZE TURKEYS—HENS, \$3; toms, \$5.10. Mrs. U. A. Towns, Bethany, Mo.

FOR SALE—BOURBON RED TURKEYS. Toms, \$5; hens, \$2.50. Mrs. S. T. White, Rose, Kan.

BOURBON RED TURKEYS, EARLY- hatched, large bone, good color. Toms, \$4; hens, \$3. A. M. Farmer, Pratt, Kan.

WHITE HOLLAND TOMS, \$4.00; HENS, \$2.50; Pekin ducks, \$1.00 each. L. F. Schroeder, Route 1, Paola, Kan.

FOR SALE—CHOICE M. B. TURKEY toms, S. C. W. Leghorn cockerels and hens. Vira Bailey, Kinsley, Kan.

OAK HILL FARM—HOME OF THE PURE- bred M. B. Turkeys. High scoring stock a specialty. Route 3, Lawson, Mo.

GIANT MAMMOTH BRONZE TURKEYS for sale reasonably, that have won blue ribbons this season. Mrs. Jesse McMahon, Blackwater, Mo.

WHITE ROCKS AND WHITE HOLLAND turkeys, size and quality. Healthy vigorous birds. Satisfaction guaranteed. Write G. M. Kretz, Clifton, Kan.

THOROUGH-BRED BOURBON RED TUR- keys—Toms, \$3.50; hens, \$2.50. S. C. B. Minorca cockerels, \$1.25. Mrs. Hallren, Utopia, Kan.

BOURBON RED TURKEYS—BIG, DARK red and correctly marked. Show winners for years. Toms, \$4.50; hens, \$3.50 each. Mrs. Clyde Meyers, Fredonia, Kan.

ROSE COMB REDS—BRED PURE FROM high-priced stock. Cockerels, \$2 and \$5 each; pullets, \$1.50 each, \$8 for six. Howard Vail, Marysville, Kan.

BOURBON RED TURKEYS FOR SALE. Over one hundred to pick from. Can furnish unrelated. Mrs. W. B. Baker, Ash Grove, Mo.

THOROUGH-BRED BOURBON TURKEYS—Choice early birds. Also Buff Rock cockerels. Prices reasonable. Mrs. Amos Andaley, Miami, Mo.

FOR SALE—HIGH-GRADE BOURBON Red Turkeys; hens and toms. Also high-grade Rhode Island Red cockerels and pullets. Write for full particulars. Mrs. Pearl Kern, Springfield, Ind.

BLUE RIBBON GIANT BOURBON RED Turkeys, toms \$5, hens \$3. Old tom weighs forty pounds. Single Comb White Leghorn cockerels, Frantz Yesterlaid strain, \$1 and \$2. Flora Smith, Amorita, Okla.

RHODE ISLAND REDS.

RHODE ISLAND RED COCKERELS, \$1 to \$3; pullets \$6 to \$10 per dozen. Mrs. F. A. Fulton, El Dorado, Kan.

ROSE COMB RED COCKERELS, \$2.50 each. Satisfaction guaranteed. John Carlisle, Vera, Okla.

LARGE DARK VELVET R. C. RED cockerels, \$1 to \$5. Bourbon Red turkeys. Charles Sigle, Lucas, Kan.

SINGLE COMB RED COCKERELS— Early egg producers. Type, size and color. \$1.50 to \$5.00. Mrs. C. P. Zimmerman, Pleasant Hill, Mo.

WE JUST WON ALL FIRSTS AT PAW- nee Rock Show in class of fifty-eight Rose Comb Reds. Cockerels reasonable. Roberts & Bowman, Holsington, Kan.

WALKER'S STANDARD STRAIN S. C. Reds. Why raise mongrels? Get our prices on fine thoroughbred stuff. Walker's Poultry Co., Chillicothe, Mo.

FOR SALE—SINGLE COMB RHODE Island Reds. A nice bunch of early-hatched cockerels and pullets, also cocks and hens. The best blood, priced right. Moore & Moore, 1239 Larimer Ave., Wichita, Kan.

MY PULLET, RED QUEEN, WON STATE silver cup as champion bird of the Lee's Summit show. Splendid pullets at \$1 and \$2. Also cockerels. Satisfaction guaranteed. Mrs. Amy Bartlett, Lonejack, Mo.

BRAHMAS.

LIGHT BRAHMAS, BETTER THAN ever. A fine lot of cockerels for sale. M. & J. W. Schreiber, Sibley, Iowa.

MAMMOTH LIGHT BRAHMAS, MALES and females, utility and exhibition, priced right. Winners and Kansas and Missouri best shows. Mrs. Oscar Felton, Route 1, Blue Mound, Kan.

ANCONAS.

FINE ANCONA COCKERELS—DARK single comb, \$1 each. Mrs. Will Torgeson, White City, Kan.

You will find a lot of bargains on Kansas Farmer's Classified Advertising Page this week. Don't fail to carefully read that page.

The Forum at Wichita, in which the show will be held, is undoubtedly the best show room in the West, insuring plenty of room and good light in every part of the room. As a show town, Wichita is excelled by none in the West, being the gateway of all trade to the Great Southwest and Oklahoma. In addition to the usual display of fancy poultry for exhibition purposes, it is proposed to hold a sales department, where breeders of fine poultry can bring their products and sell them. This will be a separate department from the show proper, and a small fee will be charged for this privilege, just enough to pay expenses.

Another new departure in this show will be an egg show. Liberal premiums will be offered for the best eggs and a great display of eggs will be the result. In addition to this department the egg-packing and poultry houses of Wichita have promised to have a fine display of their products on hand. After showing at all the local shows you can, be sure and be at the wind-up of all the shows, at the great state show at Wichita.

Roads and Land Values.

The improvement of roads has a remarkable effect upon the values of adjacent lands. In Manatee County, Florida, fifty-four miles of macadam and shell roads have been built. From 1911 to 1912 land lying along the road increased in value \$20 an acre, while even land a mile away from the road showed an increase of \$10 an acre.

Down in Spottsylvania County, Virginia, forty-one miles of road have been improved with the result that land which formerly sold for on an average of \$24.74 an acre was within three years taken off the market at an average of \$44.74 an acre.

In another county in Virginia—Dinwiddie County—this rise in land values



THE MOST NECESSARY PART OF A CULVERT BULKHEAD IS UNDER IT, NOT OVER IT.—THIS ONE IS A BUREN INSTEAD OF A PROTECTION

is again shown to follow the improvement of the roads. Here 125 miles of road were built and land between five and ten miles from the city of Petersburg advanced on an average from \$15.25 to \$30 an acre. Land ten miles from the town increased in value an average of \$16.32.

In New York the same thing has followed the building of good roads. Land values have increased in direct proportion to the improvement of the roads. In Franklin County 124 miles of road were built with the result that adjacent land showed an increase of 27.3 per cent after the roads were built.

Similar figures could doubtless be shown for every county in the United States where roads have been improved. Good roads are valuable from a purely economical standpoint, not to mention the social benefits that they bring.

New Shawnee County Grange.

The most recent Shawnee County Grange organized was Sunnyside 1622, with sixty-seven charter members and O. F. Whitney, organizer. The officers are: Carl Snyder, master; H. F. Holloway, lecturer; J. F. Doane, secretary. This Grange is located four and a half miles south of Topeka, on the Burlington game road, in District 11.

"Quick and cheap transportation means more business for everybody and a big saving in time and money."

POSTPONED GARRISON'S SALE

It has become necessary at the last moment to postpone the Shorthorn Cattle sale which Mr. Garrison has been advertising for December 17. Full particulars will be given later.

A REAL TRACTOR AT LAST**AT A LOW PRICE****Perfectly Adapted For Road Grading Purposes****WHY?****BECAUSE**

It is geared 80 to 1.
It has a Four-Cylinder Motor developing 30 H. P. and 10 on the Draw Bar.
It has a High-Tension Eisemann Magneto.
It has a Stromberg Carburetor.
And many other practicable and durable features.

IT PULLS

Three Fourteen-Inch Plows. One Road Grader.
Two Spring-Tooth Harrows. Two Road Drags, etc.

Write for proposition on Agency Contract. Dealers wanted everywhere.

MID-WEST SALES CO.,
Southwest Distributors

Kansas City, Mo.
1713-15 McGee St

PURE BRED POULTRY**LEGHORNS.**

S. C. BROWN LEGHORN COCKERELS, Six for \$5. Mrs. L. H. Hastings, Thayer, Kan.

S. C. BROWN LEGHORN COCKERELS and pullets, \$1 each, six for \$5. H. A. Ketter, Seneca, Kan.

TIP TOP R. C. BROWN LEGHORNS AND others. Write your wants. J. E. Wright, Route 2, Box 5, Wilmore, Kan.

SINGLE COMB BROWN LEGHORNS— Fifty full-blood cockerels from my best pens, both matings. W. J. Roof, Maize, Kan.

850 SINGLE COMB BROWN LEGHORN hens, pullets and cockerels, 75c to \$2 each. Address E. D. Dooley, Selma, Iowa.

SINGLE COMB WHITE LEGHORNS— fine farm-raised birds, \$1.00 each. K. Skelley, Delta, Kan.

SINGLE COMB BROWN LEGHORNS— Fifty full-blood cockerels from my best pens, either matings. W. J. Roof, Maize, Kan.

S. C. WHITE LEGHORN COCKERELS, \$1. Six, \$5. S. C. Black Minorcas, \$1 each. Mrs. J. A. Young, Wakefield, Kan.

SINGLE COMB BUFF LEGHORN COCK- erels, \$1 to \$3. Mrs. Frank Wempe, Frankfort, Kan.

CHOICE ROSE COMB WHITE LEGHORN cockerels, \$1 each, \$10 dozen. Henry Dieckhoff, Kensington, Kan.

FOR SALE—CHOICE R. C. B. LEGHORN, R. C. R. I. Red cockerels, at \$1 each or six for \$5. Mrs. John M. Lewis, Route 3, Box 18, Larned, Kan.

FOR SALE—SINGLE COMB BROWN Leghorn cockerels, from high scoring stock; 75 cents each, \$8 per dozen. Cornelius Phillips, R. F. D. 9, Emporia, Kan.

SINGLE COMB WHITE LEGHORN cockerels. White Runner drakes, priced right, satisfaction guaranteed. A. L. Buchanan, Route 3, Lincoln, Kan.

COCKERELS—SINGLE COMB WHITE Leghorns, early hatched, range raised, \$1.00 each; \$10.00 per dozen. Harry Glivens, Madison, Kan.

SINGLE COMB WHITE LEGHORNS— Egg-type cockerels, \$5, \$5.50, \$7.50; grand exhibition males, \$10 up. Free catalog and sales list. W. H. Sanders, Box E275, Edgewater, Colo.

FAMOUS PEARL STRAIN SINGLE COMB White Leghorns.—To make room I am offering one hundred pullets and hens at \$1 apiece; cockerels \$1.50, bred from trap-nested stock. Cockerel free with each dozen females. Order direct. Money's worth. R. W. Bradshaw, Ellsworth, Kan.

DUCKS

FORTY PURE-BRED WHITE MUSCOVY ducks for sale. Pairs, \$3.25; trios, \$4.50. Mary Ramsey, Manchester, Minn.

FISHLE WHITE RUNNERS, FIVE DOL- lars trio. Circular. Wm. S. Jordan, Hastings, Neb.

PEKIN DUCKS—LARGE VIGOROUS first-class stock, \$5 per trio. Also White Wyandotte chickens. M. L. Andrews, Bryant, Mo.

FOR SALE—SEVERAL WHITE RUNNER drakes, from Mrs. Myers' prize-winning stock, winners of all first premiums at State Poultry Show. Price, \$2.00 each. Thomas Owen, Jr., Route 7, Topeka, Kan.

LANGSHANS.

BLACK LANGSHAN BARGAINS, ANY age, either sex, until December 15, \$1 each. Mrs. Geo. W. King, Solomon, Kan.

BIG BLACK LANGSHANS, BRED EX- clusively for ten years. Cockerels, \$1.75. Annie Pearce, Kildare, Okla.

PLYMOUTH ROCKS.

BUFF ROCK COCKERELS, \$2 TO \$5 each. Ferris & Ferris, Effingham, Kan.

BARRED ROCK COCKERELS—CHOICE birds. Florence Belle Ziller, Hiawatha, Kan.

EXTRA GOOD WHITE AND BARRED Rocks. Sidney Schmidt, Chillicothe, Mo.

BUFF ROCKS, PRIZE WINNERS, FOR sale by C. S. Hart & Sons, Milan, Mo.

PARTIDGE ROCKS—QUALITY AND prices right. C. A. Dewey, Shelbyville, Mo.

PURE BARRED ROCK COCKERELS— Fine large early-hatched farm raised. Price, \$1.50 each. Mrs. H. Buchanan, Abilene, Kan.

WHITE ROCKS, SIZE AND QUALITY. Healthy, vigorous birds. Satisfaction guaranteed. Write G. M. Kretz, Clifton, Kan.

FOR SALE—WHITE ROCK COCKERELS, \$1 each, six for \$5. Mrs. C. J. Hose, Osborne, Kan.

FINE BARRED ROCK COCKERELS, \$1.50 and \$2 each. Write today. Fred Warren, Todd, Okla.

WHITE ROCK COCKERELS AND PUL- lets, extra large; Fishel strain, \$1.50 each. Mrs. F. S. Manning, Friend, Neb.

PURE BARRED ROCK COCKERELS, farm raised, \$1 each. Catharine Beightel, Holton, Kan.

BUFF ROCKS CHEAP TO MAKE ROOM. Satisfaction guaranteed. Freeman Alden, Ellsworth, Kan.

FOR SALE—BUFF ROCKS, PRIZE WIN- ners; choice birds at \$2 each. Mrs. John Ainsworth, Lexington, Mo.

WHITE ROCK COCKS AND COCKERELS for sale, \$1.50 and up. Nellie McDowell, Garnett, Kan.

ONE HUNDRED WHITE ROCK COCK- erels and pullets, early and late hatched, from prize winning stock. W. T. Blackwill, Quinter, Kan.

SIXTY BUFF AND WHITE PLYMOUTH Rock cockerels of extra merit for breeding or showing, priced at \$1.50 to \$5 each. A. E. Glass, Harrisonville, Mo.

LARGE SNOW WHITE ROCK COCK- erels, \$2 up. Ten years a breeder from the world's best strains. Chas. Vorles, Wathena, Kan.

BARRED PLYMOUTH ROCKS FOR SALE—E. B. Thompson strain. Thirteen years in the business. Satisfaction assured. Write me your wants. Mrs. S. T. Aydelott, Bellflower, Mo.

BARRED ROCK COCKERELS, PULLET- bred; grand breeding birds; dams score 93; have record 250 eggs in twelve months; won many prizes, largest shows. Shipped on approval. Ike Hudnall, Milan, Mo.

ORPINGTONS.

SEVENTY-FIVE WHITE ORPINGTONS, also White Langshans, Buff Rock cockerels. Mrs. Wm. Mumpower, Chillicothe, Mo.

MY BUFF ORPINGTONS GROW FASTER and lay more than others. Big cockerels reasonable. L. S. Weller, Salina, Kan.

PURE-BRED S. C. BUFF ORPINGTON cockerels, price \$3. Mrs. A. M. Combs, Bucklin, Kan.

NICE LARGE WHITE ORPINGTON hens, one and two years old. During December, in lots of three to five, \$2 each. W. G. Langehumig, Jackson, Mo.

When writing to advertisers, please mention Kansas Farmer.

BUFF ORPINGTON COCKERELS— Twenty-five good ones at a dollar each for quick sale. Twenty-five cents extra where one only is ordered. Mrs. Lillie Underwood, Oskaloosa, Kan.

Classified Advertising

Advertising "bargain counter." Thousands of people have surplus items of stock for sale—limited in amount or numbers hardly enough to justify extensive display advertising. Thousands of other people want to buy these same things. These intending buyers read the classified "ads"—looking for bargains. Your advertisement here reaches over 300,000 readers for 4 cents a word per week. No "ad" taken for less than 60 cents. All "ads" set in uniform style, no display. Initials and numbers count as words. Address counted. Terms, always cash with order.

SITUATIONS WANTED ads, up to 25 words, including address, will be inserted free of charge for two weeks, for bona fide seekers of employment on farms.

HELP WANTED.

RAILWAY MAIL CLERKS, CLERK-carriers and rural carriers wanted. 1 conducted examinations can help you. Trial examination free. Osmont, 44-R, St. Louis.

MOTORMEN-CONDUCTORS; INTERUR-ban, earn \$80 monthly; experience unnecessary. Quality now. State age. Details free. Dept. Q, Kansas Farmer.

DO YOU WANT ANOTHER \$2 DAILY? No experience, constant spare time work, knitting hosiery. Machines furnished on contract, we take product. Helping Hand Stores (Inc.), Dept. 968, Chicago.

AGENTS—SOMETHING NEW—FASTEST sellers and quickest repeaters on earth. Permanent, profitable business. Good for \$50 to \$75 a week. Address American Products Co., 505 Third St., Cincinnati, Ohio.

FREE ILLUSTRATED BOOK TELLS OF about 300,000 protected positions in U. S. service. Thousands of vacancies every year. There is a big chance here for you, sure and generous pay, lifetime employment. Just ask for booklet S-809. No obligation. Earl Hopkins, Washington, D. C.

MEN AND WOMEN 18 YEARS OR OVER wanted for government jobs. \$65 to \$150 month. 2,000 appointments monthly. Excellent chance for farmers. Vacations. No layoffs. "Pull" unnecessary. List of positions free. Write immediately. Franklin Institute, Dept. N82, Rochester, N. Y.

MEN 20 TO 40 YEARS OLD WANTED at once for electric railway motormen and conductors; \$60 to \$100 monthly; no experience necessary; fine opportunity; no strike. Write immediately for application blank. Address Manager, B167 Dwight Bldg., Kansas City, Mo.

SALESMEN—EARN \$2,000 TO \$4,000 A year. New combination, 12 tools in one. Sells at sight to contractors, farmers, teamsters, fence builders, threshers, miners. Weighs 24 pounds, lifts 3 tons. Stretches wire, pulls posts, hoists, etc. Chance for men who want honest money-making proposition. Harrah Manufacturing Co., Box M, Bloomfield, Ind.

REAL ESTATE.

OSARK FARMS AND PASTURE LAND at lowest prices and liberal terms. Write for list. Avery & Stephens, Mansfield, Mo.

EXCHANGE 160 OR 320 ACRES REEVES County for dairy cows or heifers. J. B. Miller, Pecos, Texas.

WANTED—JOB ON FARM BY EXPERIENCED farm hand, single. State wages in first letter. Address A. P. Graham, Mullinville, Kan.

BEST BUY IN KANSAS.—280 ACRES, 120 acres creek bottom, \$65 per acre; Catholic, new church. Mead Realty Co., Junction City, Kan.

WANTED—TO HEAR OF GOOD FARM or unimproved land for sale. Send description and price. Northwestern Business Agency, Minneapolis, Minn.

FOUND—HOMESTEAD NEAR FT. MOR-gan. 320 acres rich farm land, not sand. Price, \$200, filling fees and all. J. A. Tracy, Fort Morgan, Colo.

LOOK HERE—160 ACRES THREE MILES from town; some improvements, well and fence; all tillable. \$1,500. Lists. West, Ransom, Kan.

REAL ESTATE WANTED—SELL YOUR property quickly for cash, no matter where located. Particulars free. Real Estate Salesman Co., Dept. 77, Lincoln, Neb.

KANSAS CITY BUSINESS PROPERTY, 150x50 feet, corner Fifth and Troost Ave., must be sold to settle an estate. A rare bargain in the fastest growing city in the West. Address K. C. Property, care of Kansas Farmer.

DON'T BUY A FARM UNTIL YOU KNOW all about our ditched bottom land in Butler County, Southeast Missouri. No Mississippi River floods; no better land anywhere; price low, terms easy. Write owner, Neeleyville Ranch Co., Neeleyville, Mo.

FARMS WANTED—WE HAVE DIRECT buyers. Don't pay commissions. Write describing property, naming lowest price. We help buyers locate desirable property free. American Investment Association, 43 Palace Bldg., Minneapolis, Minn.

ARKANSAS FARMS—266-ACRE GRAIN and live stock farm on White River; 65 cultivation, woven wire fence; house, new barn, fine springs, fine free range. No trades. W. B. Mathewson, Yellville, Marion Co., Arkansas.

WRITE AT ONCE FOR FREE BOOKLET and map describing our fine prairie lands in Southeastern Texas Gulf Coast, near Hamshire, Texas. Ask for details of cheap excursions to Hamshire. Address owners, Theo. F. Koch & Co., Transportation Bldg., Chicago, Ill.

VICTORIA, AUSTRALIA WANTS SET-tlers; special inducements; government land; railways; free schools; cheap irrigation; 31 years to pay for farms adapted to alfalfa, corn, grains, fruit, etc.; climate like California; ample markets; reduced passages; special excursion being arranged; free particulars from F. T. A. Fricke, Government Representative from Victoria, 687 Market St., San Francisco, Calif. Box 84.

FOR SALE—ONE SECTION FINE STOCK and grain farm, 10-room residence, 75x125 cattle and hay barn, 40x50-horse and grain barn; seven other substantial, useful buildings; 500 acres ready for the plow, balance virgin oak and hickory timber; level, not one waste acre; about 100 acres meadow and pasture, 60 acres oats and wheat; graded roads; near station and creamery. Long easy terms, 6 per cent. Address Lock Box 294, Carlisle, Ark.

REAL ESTATE.

WANTED—TO HEAR FROM OWNER OF good farm or unimproved land for sale. C. C. Buckingham, Houston, Texas.

HOUSTON, TEXAS, SUBURBAN FARMS on ten years' time; fertile soil, any size tract, warm healthful climate. Price, \$25 to \$35 per acre. Geo. W. Martin, 319 First National Bank Bldg., Houston, Texas.

CATTLE.

REGISTERED JERSEY BULL, REASON-able. Terms. Percy Lill, Mt. Hope, Kan.

FOR SALE—REGISTERED HOLSTEIN bulls. Smith & Hughes, Route 2, Topeka, Kan.

FOR SALE—OUR REGISTERED HOL-stein herd bull and two young bulls. P. Haverty, Hollenberg, Kan.

FOR SALE—THIRTY-FIVE HEAD OF one, two and three-year-old fawn colored Jersey heifers, also a few cows. Also two one-year-old registered Jersey bulls. A nice lot. R. F. Hodgins, Silver Lake, Kan.

HORSES AND MULES

SHETLAND PONIES—CHARLES CLEM-mons, Coffeyville, Kan.

SHETLAND PONIES SUITABLE FOR Christmas presents. C. H. Clark, Lecompton, Kan.

REGISTERED SHETLAND PONIES FOR sale. This year's colts. Will be ready to ship by Christmas. Write your wants to N. E. Stucker, Ottawa, Kan.

HOGS.

FIVE DANDY GOOD TRIED SOWS bred. A number of bred gilts, 12 fine young boars ready for service, and a fine lot of weanings. All pedigreed and double cholera immune. E. G. L. Harbour, Baldwin, Kan.

TREES, SEEDS AND PLANTS.

SUDAN GRASS SEED, GUARANTEED free from Johnson grass, 50 cents per pound. Walter Jenkinson, Pond Creek, Okla.

SWEET CLOVER SEED—THE TRUE white blooming variety (Mellilotus Alba). Write for free sample of new crop seed and latest prices. Henry Field, Shenandoah, Ia.

GENUINE SUDAN GRASS SEED, 50 cents per pound, postpaid. 1915 catalog will soon be ready. Write for it. The Barteldes Seed Co., Lawrence, Kan.

SUDAN GRASS—NORTHERN GROWN seed, hardy and free from Johnson grass. Write for free sample and prices. Henry Field, Shenandoah, Iowa.

SUDAN GRASS, KANSAS GROWN.— Guaranteed free from Johnson grass. Inspected and approved by Kansas Experiment Station official. Wilson Shelley, McPherson, Kan.

MISCELLANEOUS.

CALIFORNIA LUCKY MOONSTONES mounted in artistic jewelry. Catalog free. H. Symonds, Dept. 4, Longbeach, Calif.

BEST LOUISIANA SUGAR CANE SYRUP direct from plantation. Bargain prices. Booklet free. J. E. McGuire, Palacios, Texas.

BEAUTIFUL CHRISTMAS CALENDAR, blotter combined; lithograph of children, sepia reproduction of prize cats and dogs. 10 cents each. E. F. K., 159 Martin St., Medford, Mass.

BUY YOUR LUMBER, DOORS, WIN-dows, shingles, etc., direct from mill, saving 25 per cent. Payment after examination, your town. Powell Land & Lumber Co., Rusk, Texas.

FARMERS, DO YOU NEED MONEY? We negotiate for farm loans, five years at 6 per cent and ten years at 5 per cent, dealing direct with borrower; 2 1/2 per cent straight commission. Correspondence solicited. Security Farm Loan Assn., 20 E. Jackson Blvd., Chicago, Ill.

FREE FOR SIX MONTHS—MY SPECIAL offer to introduce my magazine, "Investing for Profit." It is worth \$10 a copy to anyone who has been getting poorer while the rich, richer. It demonstrates the real earning power of money, and shows how anyone, no matter how poor, can acquire riches. Investing for Profit is the only progressive financial journal published. It shows how \$100 grows to \$2,200. Write now and I'll send it six months free. H. L. Barber, 431-28 W. Jackson Blvd., Chicago.

HONEY.

HONEY—FANCY LIGHT AMBER AL-falfa; two 60-lb. cans, \$10.50; amber, two 60-lb. cans \$10; single cans 25 cents extra. Bert W. Hooper, Rocky Ford, Colo.

PURE HONEY DIRECT FROM BEE farm to you, cheaper than sugar. Sixty-pound can, \$5.00; case of two cans, \$9.00. Special price on larger lots. All f. o. b. Hotchkiss, Colo. Sample free, but send 10 cents to cover mailing charges. Frank H. Drexel, Crawford, Colo.

SERUM.

FOR RELIABLE ANTI-HOG CHOLERA serum, write or wire the Kansas Serum Co., Manhattan, Kan.

PATENTS.

PATENTS PROCURED OR FEE RE-funded. Official drawings free. Send sketch for free search. Patent Exchange, Jordans Bldg., Washington, D. C.

BUILDING DIRT ROADS

[Continued from Page Fourteen.]

of the road, when the rear end of the blade should be raised high enough to allow the earth to distribute under it. To make the blade penetrate very hard, tough ground, it may be best to use only the point, elevating the rear end considerably.

In grading a new road the sod should be removed from the foundation and surface entirely on the portion to be excavated and used to fill in the low places where it can be covered with at least three feet of earth, but where this is impractical a good finish can be obtained by first cutting the sods as thin as possible and then placing them in the low places in the middle of the road and finally going back to the ditches and bringing up earth to cover and level over the sod.

It costs from \$15 to \$50 per mile to grade an earth road, depending upon the soil and condition of the road, the width graded, and the price of labor.

EDITOR'S NOTE.—The above is taken from the Highway Improvement bulletin published by the Kansas State Agricultural College for free distribution to Kansans.

Iron Culvert Convenient and Durable.

Culverts are necessary to road drainage. An otherwise good road may be a poor road because the water is not carried off the right-of-way. There are comparatively few miles of earth road in Kansas as well drained as they should be. The ready-made culvert—the culvert bought ready to place—appeals to the road builder. It requires no form, no delay in placing because of the necessity for hauling material long distances and to properly place requires no expert labor. This describes the iron culvert—its utility and permanency are no longer matters of question. The adoption of the pure iron culvert by twenty or more of the leading railways of the country, in addition to its general use throughout the country, is evidence of its adaptability to every culvert need. Pure iron,

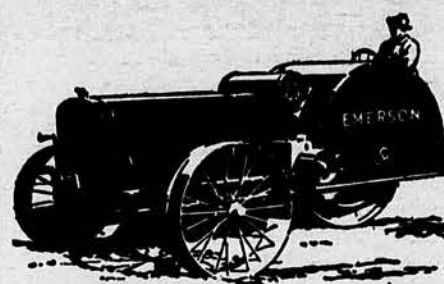


LARGE CORRUGATED CULVERT WHICH HAS SERVED FOR YEARS IN THE PLACE OF A WOODEN BRIDGE AND HAS NOT COST A DOLLAR TO MAINTAIN.

corrugated culverts do not disintegrate, crack, burst or rot. Ingot iron culverts are not to be confused with galvanized steel culverts. The steel does not resist rust as does iron, and that's the reason you should buy culverts of pure iron.

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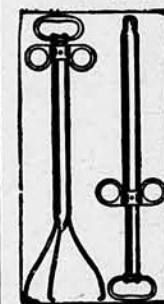
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Write for Catalog, C. W. LAMER, SALINA, KANSAS

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Four Imported Percheron Stallions, extra good show stock. One Percheron Mare and Filley. One Belgian Stallion. Four Good Jacks, Eighteen High-Grade Jersey Cows, fresh or soon will be fresh. Twelve Shorthorn Cows. Twenty One-Year and Two-Year-Old Heifers. Twenty Work Horses and Mules.
Will be sold under cover, in or shine. Free conveyance to farm to parties from distance. Five miles south, 1 1/2 mile west of Nickerson; ten miles west of Hutchinson.
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BRILLIANT blood, jet blacks, rich greys. Registered Percheron studs, 1, 2, 3 and 4 years old. I grow great big fellows with big bone and heavy quarters—I love a good horse. Visit my Percheron farm. I have the goods, and lots of them. Don't let anyone tell you they have Percherons like Fred Chandler's. Just above Kansas City.
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For quick sale, fifteen large mature jacks, all large bone, good colors, 1 1/2 to 16 hands standard, guaranteed and priced to sell. I have a large herd of jennets and will price a few reasonably. Come and see me if you mean business.
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Twenty-five registered Percherons. Colts by the champion Incleus. Mares bred to him. Jacks and jennets, all ages.
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26 Head - Registered Holstein Cows - 26 Head

All have A. R. O. records; A. R. O. dams or grand-dams. Two years old and up. Nearly all fresh in next three months. All bred to grandson of Pontiac Korndyke. Will sell one to fifteen of these, buyer to have the pick of the herd, \$150 to \$800. Four-year-old herd bull for sale cheap, a grandson of Pontiac Korndyke; gentle, sound, sure breeder, seven-eighths white. Have thirty of his daughters to breed and must change bulls. All these will be given an A. R. O. test when they freshen. On bull will consider a trade for span of young draft mares or registered Holstein heifers or heifer calves. Also have three young bulls five and six months, nothing older, A. R. O. dams or granddams.
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In Holland the average yield of milk per cow is 10,000 pounds; in this country it is under 4,000 pounds. That's why dairying is more profitable here than anywhere else in the world, despite the high cost of land and feed and the fact that prices received for dairy products are no greater than in America.

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HERD BULL MATERIAL, BACKED BY RECORDS.

One grandson of Pontiac Hengerveld Parthenia (62 A. R. O. daughters including Agatha Pontiac, 36.9 pounds butter, 7 days). Dam, Lady Jane Eyre, 19.08 pounds butter, 7 days. Others equally well bred. Plenty of A. R. O. records close up. A few cows and heifers. Prices reasonable.
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Prince Hadria at head of herd. He has 26 A. R. O. sisters, 21 brothers and several daughters. Extra choice young bulls for sale out of 600-pound A. R. O. dams. Farm near town. W. E. Bentley, Manhattan, Kan.

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January 21, 1915

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Fifteen choice early spring boars—big husky fellows, ready for use. Priced, \$25.00. First check gets choice.
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25 SPRING BOARS, sired by Recler by Big Wonder, Bud Hadley by Big Hadley, and Deming Chief by Bill Chief. Big-type breeding and cholera immunized. Also a few goods sows priced reasonably.
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A's Big Orange March Pigs, both sexes, from sows of big-type breeding. Have lots of stretch and good bone; thrifty condition, will make big ones. All immune.
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Jan. 13—Improved Stock Breeders' Consignment sale of Registered Percherons, Fair Grounds, Topeka, Kan. H. W. McAfee, Manager.
Jan. 18—Spahr & Spahr, Wichita, Kan.

Percherons and Other Draft Horses.
Jan. 26, 27, 28, 29—C. W. Hurt, Arrow-smith, Ill.

Jacks and Jennets.
March 8, 1915—G. C. Roan, La Plata, Mo.

Angus Cattle.
Jan. 21, 1915—Consignment sale, Manhattan, Man. L. R. Brady, Manager.

Jersey Cattle.
Dec. 16—Nichols & Sterling, Abilene, Kan.

Shorthorns.
Jan. 15, 1915—Consignment sale, Manhattan, Kan. L. R. Brady, Manager.

Poland Chinas.
Jan. 21—J. R. Cline, Iola, Kan.

Jan. 20—Roy Johnson, South Mound, Kan.

Feb. 2—John Kemmerer, Mankato, Kan.

Feb. 9—E. E. Knox, South Haven, Kan.

Feb. 10—Agricultural College, Manhattan, Kan.

Feb. 16—E. D. Frazier, Drexel, Mo.

Feb. 18—J. D. Mahan, Whiting, Kan.

Spotted Poland.
Feb. 10—H. L. Faulkner, Jamesport, Mo.

Durocs.
Jan. 22—Louis Koenig, Solomon, Kan.

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Feb. 9—Agricultural College, Manhattan, Kan.

Feb. 12—Howell Bros., Herkimer, Kan.

Feb. 18—Buskirk & Newton, Newton, Kan.

Feb. 23—J. R. Jackson, Kanapolis, Kan.

March 11—W. W. Otey & Sons, Winfield, Kan.

March 12—G. C. Norman, Winfield, Kan.

O. I. C. Hogs.
Jan. 20—William Bartlett, Pierce, Neb.

Last Call for Garrison's Sale.

Nothing looks better in the live stock investment line at the present time than some well-bred cows. Breeders and farmers should not forget the offering of useful Shorthorn breeding cattle which Mr. Garrison will sell at his farm, December 17. The sale will be held four miles west of Summerfield and seven and one-half miles north of Beattie, and buyers will be met at both points.

Shorthorn Herd Bulls.

Anyone wanting a Shorthorn bull with the breeding and quality that goes with a real herd header should get in touch with Dr. W. C. Harkey, of Lenexa, Kan. He is offering two herd headers ready for service, one red, the other white; one a Crickshank Victoria and the other a Gallant Knight. They are strictly in the herd header class and will be a credit to any herd. Look up his card and write for prices and descriptions.

Huston's Duroc Jersey Boars.

The writer called a few days ago on the well known Duroc Jersey breeder, W. R. Huston, Americus, Kan. Mr. Huston is not only a breeder, but a feeder. He knows how to grow and develop hogs. He has the best blood lines he can buy, then gives them good care. He is offering fifteen spring boars sired by Golden Model 4th and Country Gentleman. In this bunch of boars are several herd headers, bred right and grown right. There is also offered one splendid March boar sired by Long Wonder and out of Golden Queen 37th. This sow was in the young herd that won the silver cup at Des Moines State Fair. This young hog is a very promising herd boar and is bred right at the top. Please read ad in this issue and write Mr. Huston or go see his herd. Kindly mention Kansas Farmer.

Bruce Saunders' Percherons.

Anyone in the market for high class registered Percherons should look over the offering of Bruce Saunders, of Holton, Kan. His Percheron herd is headed by Incleus, one of the best Percheron stallions in the state. This stallion was awarded second premium at the Topeka State Fair in 1914 in a very strong show and was a strong contestant for first place with Joel, the noted show stallion and prize winner. Pauline, a daughter of Incleus, was first in her class at the Topeka State Fair, 1914, and was champion in the horse show recently held by the Jackson County Improved Stock Breeders' Association. Incleus was the champion stallion of this show and his colts were the prize winners in the colt show. He is a splendid individual and Dr. C. W. McCampbell, of the Kansas State Agricultural College, who judged the horses and colts at the recent Jackson County show, regards him as an exceptionally good breeder. Mr. Saunders is also offering a fine lot of young Jacks and jennets. Look up his card in Kansas Farmer and get his prices. Please mention Kansas Farmer when writing.

J. C. Robison's Percheron Sale.

Breeders and farmers interested in high-class registered Percherons should not overlook the Robison sale at Towanda, December 17. This will be the only sale Mr. Robison will hold this winter and his offering will consist of twenty-five stallions and twenty-five mares and will include his 1914 show herd. The stallions and a number of the mares were sired by Casino; ten two-year-old stallions and there will be a number of mares in the sale bred to Casino. The offering will include Kapitole, grand champion mare at Kansas State Fair at Hutchinson, Oklahoma State Fair and Ft. Worth Live Stock Show; Vincent, a three-year-old black stallion first in class and grand champion at the recent Kansas State Fair; Flora and Theresa, one of the greatest pairs of mares ever shown in harness in the West, weight 3,900 pounds the pair, both showing heavy in foal to Casino; ten two-year-old stallions averaging 1,600 to 1,850 pounds, and three-year-old stallions weighing over a ton. Write at once for catalog, mentioning Kansas Farmer.

Buy More Good Holsteins.

David Coleman, the Holstein man of Denison, Kan., has just made a notable addition to his breeding herd in two cows and two heifers from the herd of H. B. Cowles, Topeka. The cows and Maple Knoll Inara and Inka Hillard Johanna. The former traces to Princess of Wayne with her extraordinary average of nearly five gallons a day for ten years following her first freshening, and an

POLAND CHINAS

BIG POLANDS—EXTRA QUALITY

Boars and glits, March and April farrow. Sired by Nobleman 2d and Long King's Equal 2d, out of our best sows. Pairs and trios not akin. Priced right.
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MT. TABOR HERD POLAND CHINAS.
Pairs not related, set of four boars, 150 spring pigs by Big Mogul, son of Mogul's Monarch, out of Expansion dams. Bred sows and glits, four yearling boars. Bargain prices next sixty days.
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Both sexes, of breeding age, sired by Jumbo King 44555, Sir Bredwell 67086. Also pigs. Sow herd represents the best blood lines. Farmers' prices.
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Ten choice Poland China boars weighing from 180 to 350 pounds. Lots of quality, best blood lines. Priced from \$18 to \$30 for quick sale.
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March and June boars. They are big, have the quality. Best big-type Poland breeding. Also extra August pigs, \$25. Boar and two glits not akin, \$60.
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For thirty days, special price of \$20 for fine male pigs, herd header prospects included. Sired by Choice Goods and Wedd's Long King, two of the best big-type boars living.
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Frank offers Poland of size and quality. He will send you a boar worth the money. His circular gives full information. Write for a copy. BEN FRANK, Jefferson City, Mo.

SPOTTED POLANDS—Few spring glits;

some nice fall pigs. Prices reasonable.
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Legal Tender Immune Durocs

Boars, 75 to over 200 pounds; fall yearlings, spring glits bred. All immune. Sales made in seventeen states. Write your wants.
J. E. WELLES, FAUCETT, MO.

unofficial record of nearly 30,000 pounds in a year; and to Alta Posch, that long headed the A. R. O. two-year-olds with a butter record of over twenty-seven pounds in a week. The other is granddaughter of Colantha Johanna Lad, sire of several year's record champions, whose owner has refused \$30,000 for him. The heifers are Genista Korndyke and Wynette Korndyke Juliana. They trace respectively to Paul DeKol Jr., sire of Creamelle Vale, that heads the list with a semi-official year's record of 29,591 pounds of milk, and to Juliana DeKol, that in her time headed the A. R. O. two-year-olds for six years at a stretch. On the sire's side they have DeKol, Netherlands, Korndyke and Johanna blood lines. They are both by Korndyke Butte Boy Jr., the senior herd sire in the Cowles herd.

Weller's Immune Durocs.

The card of J. E. Weller, Faucett, Mo., breeder of Duroc Jerseys, appears in this issue of Kansas Farmer. Mr. Weller has one of the good herds and now offers a bunch of fine boars and fall yearling bred sows, all immune. Among the boars is a corking good one of March farrow that some breeder who wants to add size and stretch to his herd should look after. He measures 58 inches from end of nose to root of tail, bone 6 1/2 inches, stands on good feet, with good head and ear and otherwise good. This pig has plenty of quality as well as size. The first check for \$40 will take him. He is a good prospect and should mature large and smooth. A litter mate is priced at \$30. He is hardly as long but is heavier-boned and a good one. A few good ones of April farrow are priced at \$25. The yearling glits are priced from \$30 to \$35. If on the market for anything in the above line, look up his ad and write him or forward order at once and it will be filled at the above figures. Mr. Weller is a reliable breeder, has sold stock in seventeen states, and is a good judge. The last volume printed shows thirty-three head recorded bred by him. He has a good trade and makes but one price on any of his stock.

Give Useful Christmas Gifts.

Several years ago there sprang into existence the Society for the Prevention of Useless Giving, and the members of it became known as "Spugs," a word formed from the first initials of the main words of the name. There are of course no initiation fees or dues or anything of that sort—no personal requirements of any kind. All that you do to become a Spug is to stop useless gifts and giving. Not such a bad idea, for it must be admitted that many Christmas gifts are far from useful, and the best that might be said about them is that they are Christmas gifts. When selecting a gift it is well to try to get something which will be useful to the recipient, for a gift of this sort is always appreciated the most. Musical instruments are almost without exception gifts which are very acceptable, and a Victor or Victrola will be welcomed with delight in any home. It is a pleasure not only at Christmas time but all the time. It would be well to at least hear the Victrola before getting any Christmas gift that will have a place in your home; or if there is already a Victor or Victrola in your home, some new Victor records will make a most acceptable gift. Any Victor dealer will be glad to demonstrate the different styles of this wonderful instrument and play any music you wish to hear, or you can write to the Victor Talking Machine Co., Camden, N. J., and they will gladly send their latest catalogs of instruments and records.

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The \$5,000.00 Blue Belle's Golden Rose-boy, 85230, heads the herd. His sons and daughters, all ages, for sale. Beauty and production—Jerseys that please. Write your wants. Send for circular giving description of herd, production, breeding, etc.
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Young bulls bred for utility and beauty. Priced to sell.
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Springing heifers, granddaughters of Noble of Oaklands, and his half brother. All registered. A dozen young bulls. Part time to reliable parties. Write your wants or come.
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Established 1878.
 Bulls of Register of Merit, imported prize winning stock. Also cows and heifers.
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TWO JANUARY BULL CALVES.
 Out of high producing dams; Flying Fox and Golden Fern's Lad breeding; for sale at very low prices.
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A FEW CHOICE SONS AND DAUGHTERS OF FINANCIAL COUNTESS LAD
 and other noted bulls; young cows will milk FORTY to SIXTY POUNDS per day, out of richly bred large producing dams. Priced reasonably. Must reduce herd.
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 Butter-bred bull calves from heavy producing cows, priced right.
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For Sale—A choice lot of cows, bulls and heifers, all registered, with good quality.
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Twelve extra good young bulls. Some extra fine young stallions, among them first prize and champion of Topeka Fair. Also young cows and heifers.
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PLEASANT VIEW STOCK FARM.
 Red Polled cattle. Choice young bulls and heifers. Reasonable prices.
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They are going—only six left. Large and growthy, grandsons of Iowa Protection. Will make valuable herd headers.
DORNWOOD FARM, TOPEKA, KANSAS
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Eighty boars and gilts of spring farrow, ready for service, sired by Bode's Model No. 31295, Gage's Pride No. 38933. Best of breeding and priced right. Large-boned prolific kind.
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Choice March and April boars and gilts by Illustrator, dams by Frost's Buster, a sire of prize winners. A top lot of individuals priced to sell quick.
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Two outstanding fall boars ready for service, \$40 and \$50 each. Twenty spring boars, \$25 to \$40 each. Fifty sows and gilts bred for spring litters, \$35 to \$75. For full information address
H. E. CONROY, Nortonville, Kansas.

GUERNSEY CATTLE**IF YOU AIM**

To produce the best dairy product, that which will give you the greatest returns from the market, you must have

GUERNSEY CATTLE

I can now offer for sale 150 head from my recent importation, consisting of cows, two-year-old in calf heifers, yearling heifers, yearling bulls and bull calves. Representatives of the best families and types.

FRANK S. PEER
Osceola Farms Cranford, N. J.



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DUROC JERSEYS**TATARRAX HERD DUROCS**

Two hundred spring gilts, in lots to suit customer, from one to a carload. Also choice boars. Entire spring crop immunized. Pigs by Tattarrax, G. M.'s Tat Col. and Kansas Col. by Cherry Col. and Tippy Col. Come and see our herd.
BUSKIRK & NEWTON, Newton, Kansas.

COL. WONDER DUROCS

Col. Wonder, his daughter, Sire, Grand sire and Great Grand sire were Grand Champion winners at Iowa, Nebraska and Missouri State Fairs. No other boar can boast of as many champions backing him. When you buy from my herd you get the best blood. The best lot of boars I ever raised. Special prices to move them. Write or come.
CHAS. L. TAYLOR, R. E. 1, Olean, Mo.

Great Duroc Herd Boar

Wylie's Good Enuff 49485, by Good Enuff Again King, the grand champion of Kansas, 1913, a litter brother of first prize yearling at Kansas State Fair, 1914. Excellent breeder. Will take a high-class early spring boar in part pay. Write for description and price.
A. L. WYLLIE & SON, Clay Center, Kan.

Durocs of Size and Quality

Immunized boars, bred gilts, from large prolific stock. B. & C's Col., Superba, Defender, Perfect Col., Good E Nuff Again King and Ohio Chief blood lines. Description guaranteed.
JOHN A. REED, LYONS, KAN.

CHOICE SPRING BOARS

Prices low—\$15 and \$25. Quality high. Sired by Enoch's Choice, dams by Chief Model.
ENOCH LUNDGREN, OSAGE CITY, KAN.

IMMUNE DUROC JERSEYS

Twenty-five head immune boars of April farrow. Best of breeding. Good length and plenty of bone. Write for prices.
N. D. SIMPSON, Bellair, Kansas.

BON ACCORD DUROCS

Nice lot of spring boars, including a good herd header out of the grand champion sow, Model Queen.
LOUIS KOENIG, SOLOMON, KANSAS.

GOOD ENUFF AGAIN KING
 The Grand Champion of Kansas, 1913. Crimson Wonder 4th, a second prize boar. We have a number of herd boars for sale reasonably.
W. W. OTEY & SON, Winfield, Kansas.

FANCY DUROC BOARS AND GILTS.
 Fall boars by Smith's Graduate by J. R.'s Col. by Graduate Col., out of best sows. Choice lot of gilts by J. R.'s Col. bred for June litters to Gold Medal. Priced for quick sale.
J. R. SMITH, Newton, Kansas.

CRYSTAL SPRING FARM HERD.
 For Sale—Ten head of last March boars weighing 225 to 250 pounds; dark cherry and out of large prolific sows. Will be priced very reasonably and guaranteed as represented.
Arthur A. Patterson, Ellsworth, Kan.

GOOD DUROC JERSEY BOARS.
 Twenty-two fall and spring boars by Country Gentleman 132541, Golden Model 4th 161011, and other good boars. Good individuals. Best breeding, immunized and priced right. Call or write today.
W. E. HUSTON, Americus, Kansas.

HILLCREST FARM DUROCS

A lot of boars ready for service. Price, \$20 and \$25. First order gets choice. All immunized.
E. N. FARNHAM, HOPE, KANSAS.

MULE FOOT HOGS

GRAFF'S MULEFOOT HOGS.
 April and May boars and gilts, choice bred sows, priced cheap.
E. E. GRAFF, Route 2, Rosendale, Mo.

SHORTHORN CATTLE SALE**WEDNESDAY, DECEMBER 17, 1914****SUMMERFIELD, KANSAS**

At farm four miles west and one and one-half miles south of Summerfield, Kansas, on K. C. & N. W. Railroad, and eight miles north of Beattie, Kansas, on St. Joseph & Grand Island Railroad. Free transportation from either place to the sale.

42 High Class Shorthorn 42 Cows, Heifers and Bulls

Eighteen cows from 3 to 8 years old, in calf or calf at side. Sixteen bulls ranging in age from 9 to 18 months. Six head of yearling heifers, and heifers 9 months old.

The cows in this offering are regular breeders, thin in flesh, just in a condition to go right on doing good for the buyer as they have done for us.

Practically all of the young stock to go in this sale was sired by our herd bull, My Choice 317130, a pure Scotch bull of great beef qualities. The cows of breeding age are with one exception bred back to this bull. The cows in the offering represent the Young Marys, Raspberries, Adelades, Floras and Pomegranates. Send for catalog. Owners,

A. B. GARRISON & SON**O. A. TILLER****Summerfield****Kansas****AUCTIONEERS—H. S. DUNCAN AND F. E. KINNEY.****BREEDERS' DIRECTORY**

The following classified list contains the names of many of the reliable breeders of pure-bred live stock. They will gladly answer your inquiries. Your name should be in the list. If interested, write **LIVE STOCK DEPARTMENT, KANSAS FARMER**, for further information.

ANGUS CATTLE.

Bert McIlvaine, Lebanon, Mo.
AYRSHIRE CATTLE.
 Loveland Farm Co., Omaha, Neb.

HEREFORD CATTLE.

H. V. Baldeck, Wellington, Kan.
HOLSTEIN CATTLE.
 T. M. Ewing, Independence, Kan.
 C. E. Bean, Garnett, Kan.
 S. E. Ross, Route 4, Creston, Iowa.

JERSEY CATTLE.

W. F. Holcomb, Clay Center, Neb.
 C. J. Morek, Storden, Minn.
 Hunkydory Jersey Farm, Fairfield, Iowa.
 Hal C. Young, Lincoln, Neb.
 J. B. Porter & Son, Mayetta, Kan.

POLLED DURHAM CATTLE.

J. H. Walker, Lathrop, Mo.
 H. F. Gledinghogen, Useful, Mo.

RED POLL CATTLE.

John M. Goodnight, Fairgrove, Mo.

SHORTHORNS.

G. A. Laude & Sons, Rose, Kan.
 C. H. White, Burlington, Kan.
 E. C. Holland & Son, Milton, Iowa.

BERKSHIRE HOGS.

N. H. Gentry, Sedalia, Mo.

DUROC JERSEY HOGS.

D. O. Bancroft, Osborne, Kan.
 Judah Bros., Hiattville, Kan.

HAMPSHIRE HOGS.

H. D. DeKalb, DeKalb, Iowa.

Guernsey Cattle.

Fred Wille, Columbus, Neb.

POLAND CHINA HOGS.

F. M. Anderson, Lathrop, Mo.
 Henry Koch, Edina, Mo.
 W. A. Prewett, Asherville, Kan.
 Austin Smith, White City, Kan.

SHROPSHIRE SHEEP.

Locust Lawn Farm, Oakland, Ill.

POLLED DURHAM CATTLE**ROAN HERO 3613 - 229963**

THE INTERNATIONAL CHAMPION heads my herd of Double Standard Polled Durhams. Few choice young bulls for sale. Mo. Pac. Railway 17 miles southeast of Topeka, Kansas. Farm adjoins town. Inspection invited.
D. C. VAN NICE, Richland, Kansas

POLLED DURHAMS FOR SALE

Herd headed by Roan Choice and Matchless Avon. Young stock, both sexes, for sale. Prices reasonable. Come and see my herd.
C. J. WOODS, CHILES, KANSAS.

SHORTHORN CATTLE**HIGH-CLASS SHORTHORNS**

Five bulls, 10 to 13 months old; five young cows close to calving; five young heifers. These cattle are all of good quality, in good condition, and are a clean, healthy, useful lot of cattle. Priced to sell quick.
C. H. WHITE, BURLINGTON, KANSAS.

Dual Purpose Shorthorns

Splendid red bull, 14 months old, recorded. Dam has a butter fat record of ten pounds in seven days. \$125 gets him.
JEWELL BROS., Humboldt, Kan.

SHORTHORN CATTLE**SHORTHORN HERD BULL**

Good News, grandson of Choice Goods. Can use him no longer. This bull is a great bargain.

Also three young bulls one to two years old. Prices reasonable. Come and see me.
JOHN REGIER, WHITEWATER, KANS.

CEDAR LAWN SHORTHORNS.

Seven young bulls, 8 to 12 months of age, by Secret's Sultan. Also younger bulls and some good yearling heifers and cows in calf or calves at side. Prices reasonable.

S. B. AMCOATS, CLAY CENTER, KAN.

SHORTHORN BULLS

Two real herd bulls—one red, one white. Cumberland's Last, a Cruikshank Victoria, and Prince Valentine 4th by Gallant Knight. Also some bull calves at weaning.
DR. W. C. HARKEY, LENEXA, KAN.

HEREFORD CATTLE

HEREFORD BULLS—POLAND BOARS.
 Keystone Breeding Farm offers some extra choice young bulls, also some high-class Poland boars, March farrow, sired by Blue Valley Look; dams by Blain's Last Hadley and Big King. Attractive prices.
C. F. BEHRENT, Oronoque, Kansas.