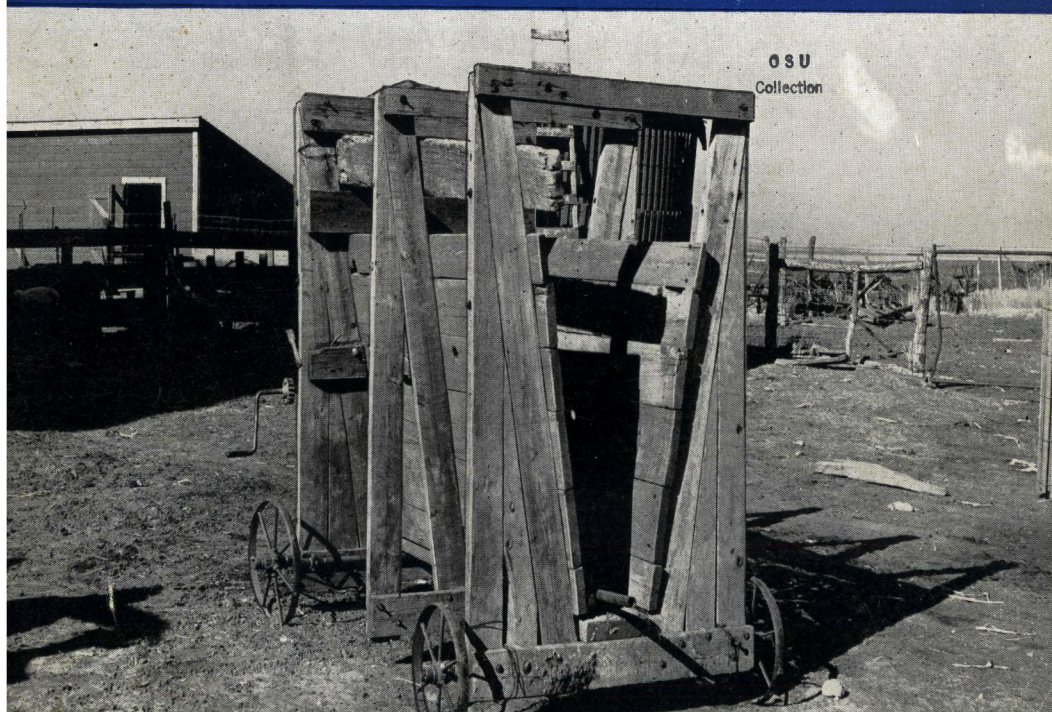


FARM LABOR SAVING DEVICES



Practical Labor Saving Devices

by C. T. Sturdivant

Extension Agricultural Engineer

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Circular No. 426

EXTENSION SERVICE, OKLAHOMA A. AND M. COLLEGE

Shawnee Brown, *Director*

Stillwater, Oklahoma

Practical Labor Saving Devices

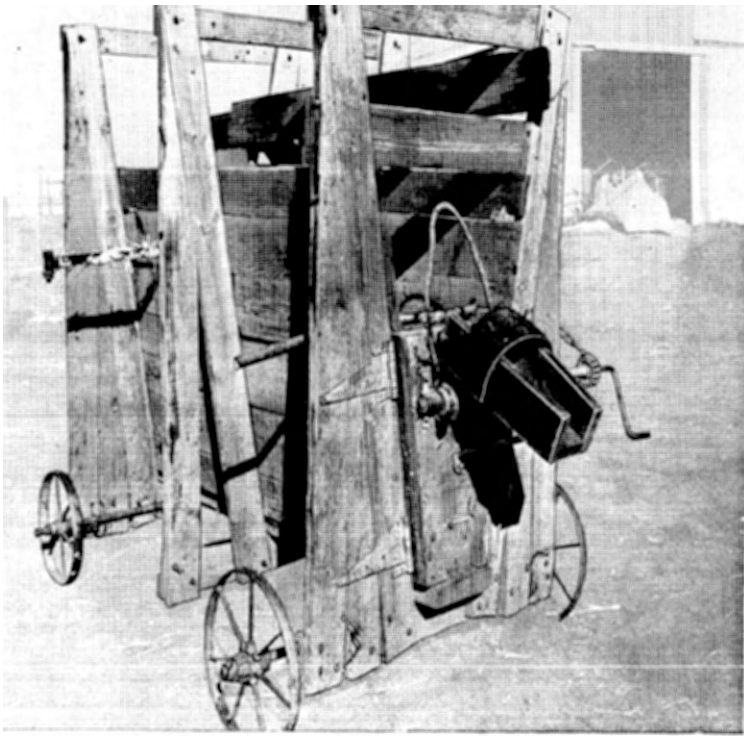
The plans contained in this bulletin are all practical farm labor saving devices that have been developed by farmers and shop men of this state. Definite specifications have been given for most of the plans, however, some of them will necessitate changes in order to fit the equipment that is found on the farm.

The majority of the material used in construction of these units can be found in discarded equipment. Many of the farmers are well equipped with farm shops complete with welding units, lathes, and press drills. Where this equipment is available most of these plans can be developed from the instructions and suggestions found in this publication.

The purpose of this bulletin is to furnish ideas to farmers for making labor saving devices, to assist in solving the labor shortage, and to encourage the utilization of scrap material found on the farm.

Shawnee Brown

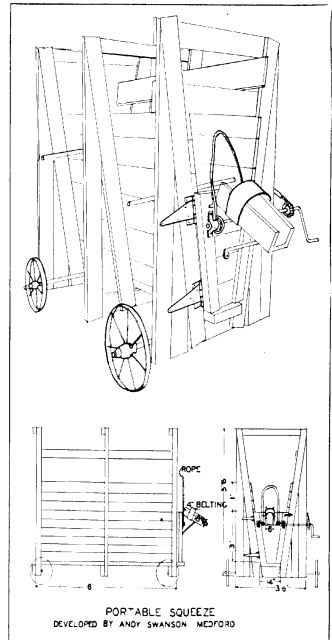
Director

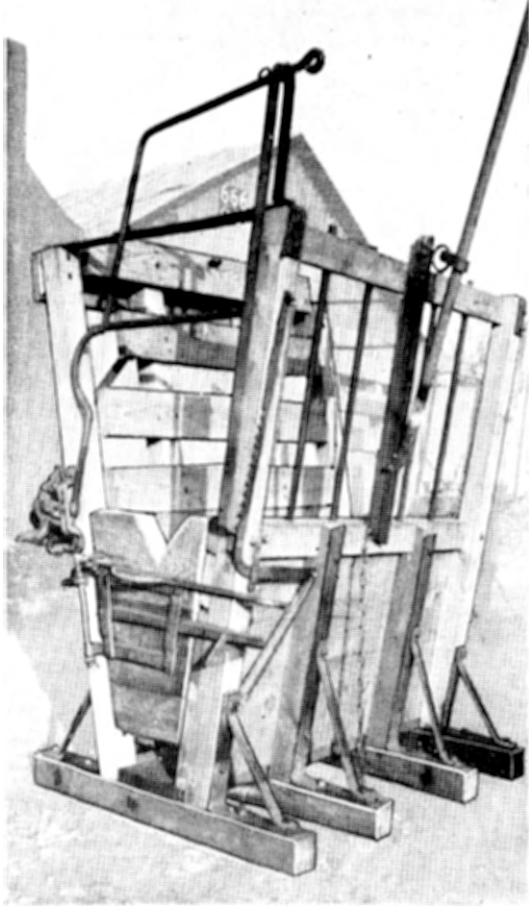


Portable Stock Squeeze

This portable stock squeeze was developed by Andy Swanson of Medford, Oklahoma. It is mounted on four implement wheels about 10 inches in diameter. The braces consist of 2 x 6 and the side walls are made of 1 x 6 material. If a solid side is not desired the side pieces can be spaced, but the spaces should not be large enough to permit the foot of the animal to pass through the opening.

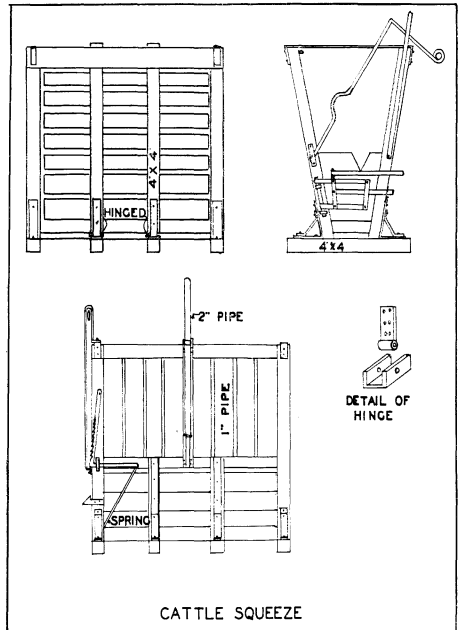
A trough made of three 1 x 6 and 18 inches long is fastened on to the gate into which the head of the animal is placed. The animal is drawn into the squeeze by the means of a simple winch and ratchet. After the animal is led into the squeeze the head of the animal is forced into the trough and underneath the belting by placing the rope over the head and by operating the winch and ratchet. This is a practical labor saving device for handling livestock, for treating them for disease, trimming hoofs, dehorning, etc.

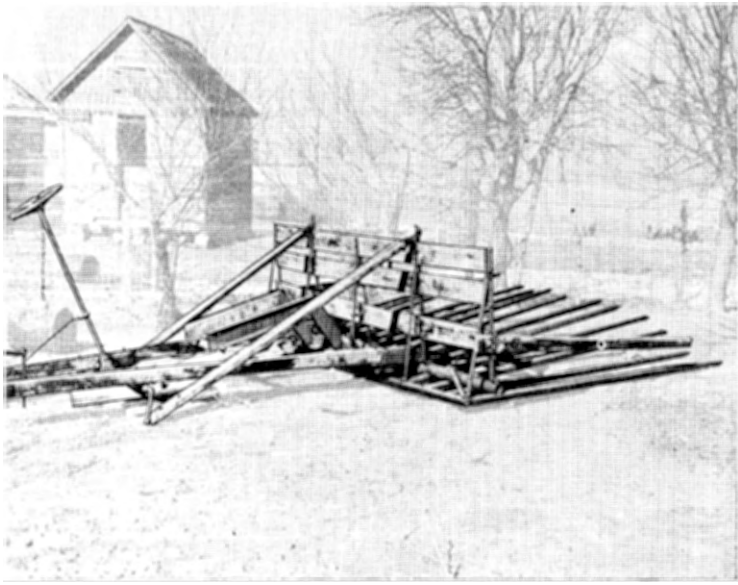




Cattle Squeeze

The plan below is of a practical portable cattle squeeze. The dimensions are not included in this plan because of the variation in sizes of livestock that are handled in the squeeze. The sides should be boarded up with 2 x 6's and the space between the boards should not be large enough to permit the stocks feet to pass through them. The squeezing rod should be 1 inch in diameter and is held fast by a ratchet. One side of the squeeze is hinged to allow for adjustment. This squeeze was developed by the Martin Machine Shop, Buffalo, Oklahoma.

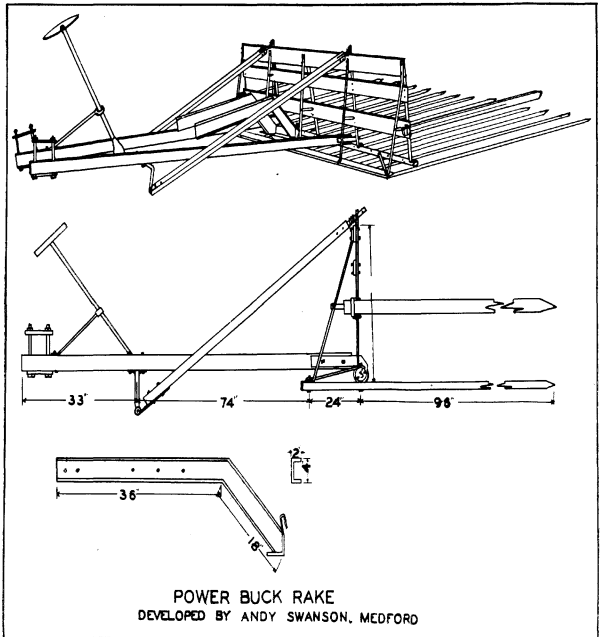


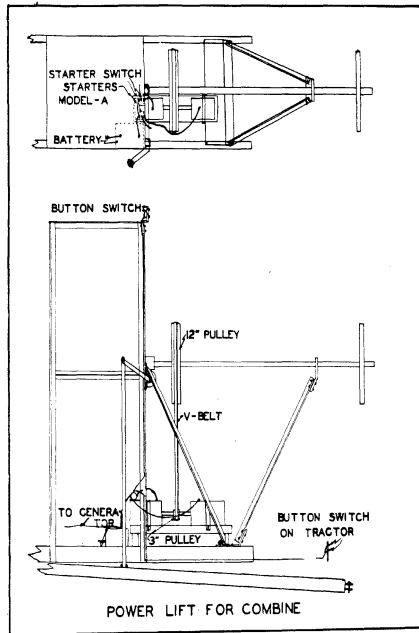


Power Buck Rake

The power buck rake if properly constructed has real merit in the hay growing section of Oklahoma, because a buck rake full of hay can be carried from the field to the hay mow, stack or to the baler. With a tractor equipped rake a larger load can be handled with greater ease. The buck rake shown in this plan will fit most any type of farm tractors. However, the dimensions will have to be varied to fit the tractor that is being used. The tilting device as shown in the plan consists of a tractor or truck steering wheel and steering device.

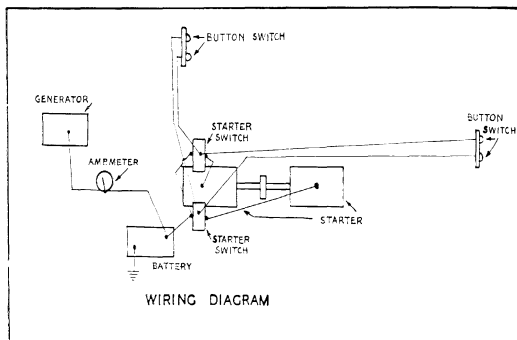
The worm gear provides a breaking affect in that the rake is held in place by the gear. Where extremely long hauls are being made the addition of two crazy wheels on to the rake would be desirable.

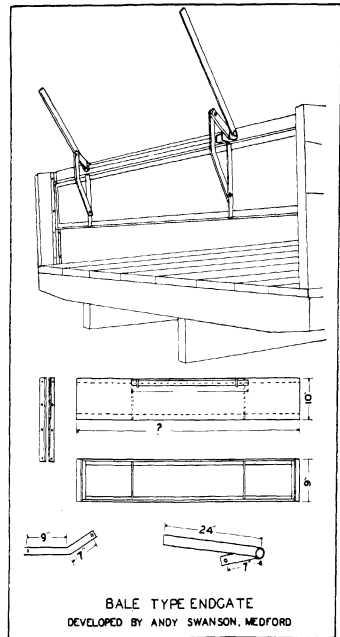
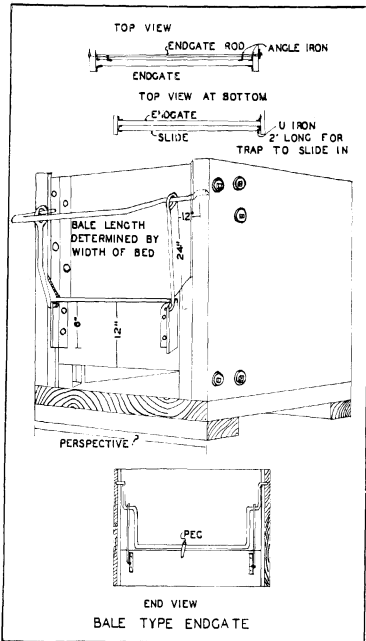
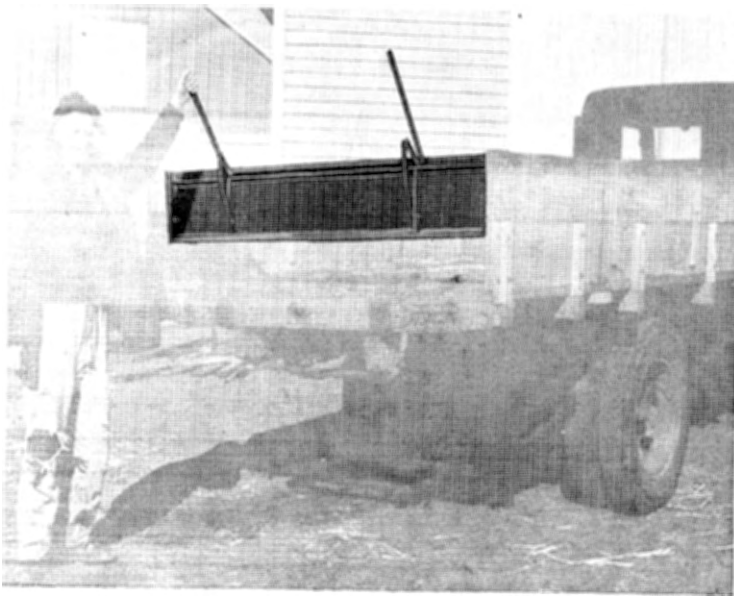




Power Lift for Combine

An efficient power lift can be made by using two starters placing them with the pully shaft end to end. This will give a clock-wise and counter clock-wise direction of pull. The battery is grounded and the positive side is connected to the generator through the ampmeter and to the positive side of the battery. The cable is connected to the starter switch and then to the other switch. This gives current to both switches. The starter switch will then connect to their respective starters and they are wired to the controller from either the combine or tractor by a duel set of wires. This gives direct control of the lever by pushing one switch for leveling and the other switch for lowering. An efficient power winch could be developed in the same manner as the lever. The suggested drawing below will assist one in developing a lever or winch.



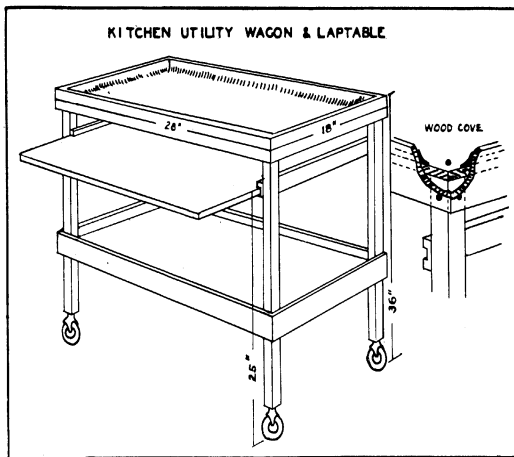


Bale Type Endgate

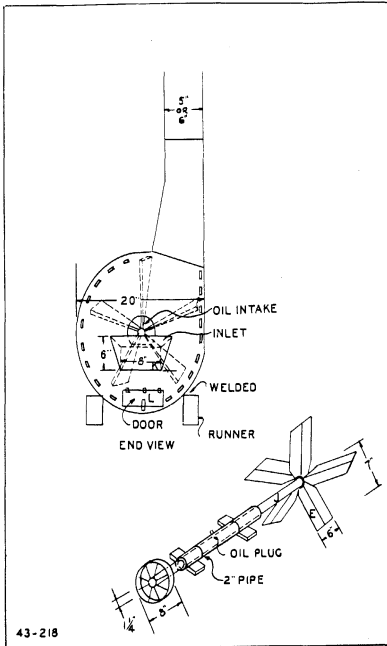
Two plans of the bale type endgate are shown. Both of these plans were developed in Grant County. The lever type by Andy Swanson Medford, Oklahoma and the bale type by Earl Franklin of Pond Creek, Oklahoma.

It takes on an average of four minutes to unload the standard truck bed. With an endgate of this type the time can be reduced 2 minutes. These endgates can be constructed of either wood or steel and can be made to fit any truck or pick-up truck. The length will depend on the width of the bed and by using this method and lifting the endgate the wheat can be unloaded with a minimum of effort and time.

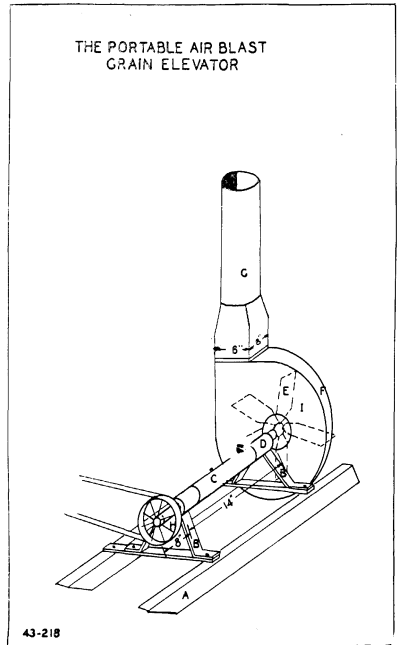
Kitchen Utility Wagon



A kitchen wagon if built and placed on rollers will save the farm house wife many steps. Attached is a suggestive plan for constructing such a unit.



43-218



43-218

The Portable Air Blast Elevator

This elevator was developed by Amos E. Pittman of Beaver, Oklahoma. It consists of two sled runners that are made from an old car or truck chassis, a drive shaft mounted in a two inch pipe with babbitt bearings and to one end of the drive shaft is attached an 8 inch pulley and to the other end a 5 blade fan. The construction and assembly of this unit will be discussed alphabetically.

A. consisting of two metal runners or two 2 x 6 wooden beams bolted or welded together with horizontal braces. The length depending on the availability of materials. The minimum length should be 5 1/2 feet and the runners spaced approximately 24 inches apart.

B. to the horizontal braces bolt or weld the two inch pipe.

C. provides a solid footing and adequate bracing for the drive shaft assembly. These braces should be approximately 14 inches apart. Pour babbitt bearing approximately four to five inches long in each end of the pipe in such a manner that a 1 1/4 inch drive shaft will fit snugly. On top and in the center of the pipe C drill a 3/8

inch hole through which oil or lubricant can be placed by so doing the drive shaft runs in oil at all times and by seepage and gravitation the babbitt bearing will be lubricated.

D. is the babbitt bearing approximately five inches long. The babbitt should be melted and poured around the drive shaft after the drive shaft has been centered in the pipe. Place wicking on the lower side where the bearing edge should be. This will prevent a solid bearing from being formed and will leave a hollow place in the center for lubricants.

E. is the blade for the fan. There are five of them, seven inches long and 6 inches wide welded or bolted on to the spider or hub. The fan should be reinforced and properly braced because tremendous force is placed upon the fan blades when operating at high speeds or under maximum loads. The fan should be set up, operated and balanced to prevent vibration.

F. the fan drum is approximately 20 inches in dia-

meter and 8 inches wide. Smaller drums can be used. Some farmers use the complete fan assembly from a number 26 gleaner combine. The drum F is welded to the sled runners A.

G. the outlets to the drum F has an opening of 6 inches in diameter and can be reduced to 5 inches so that galvanized tubing can be placed on the outlet providing a chute through which the grain can be blown to the truck or bin.

H. is an 8 inch pulley mounted on the left end of the drive shaft to which is attached the belt from the power unit.

I. consists of two openings in the center and on both

sides of the drum providing an inlet for air and after sufficient speed has been developed no loss of grain will be had from these openings.

J. is the drive shaft approximately 30 inches long and $1\frac{1}{4}$ inches in diameter.

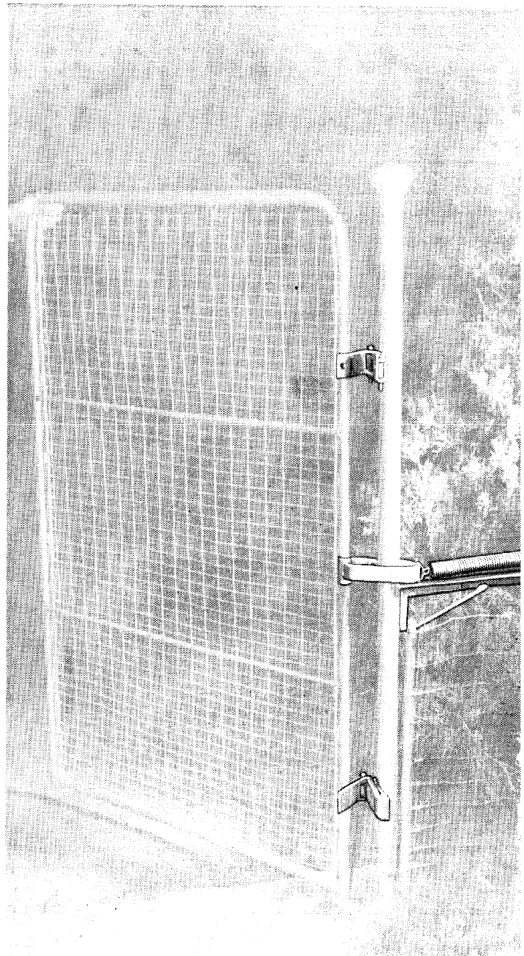
K. is the grain in-take 5 inches high and 8 inches wide.

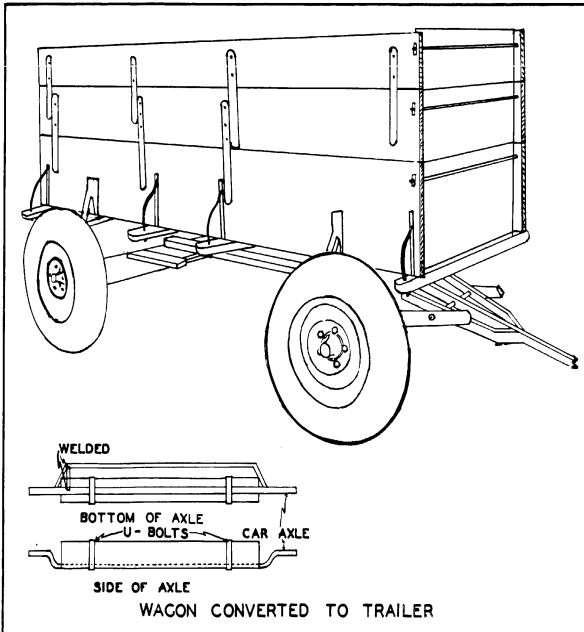
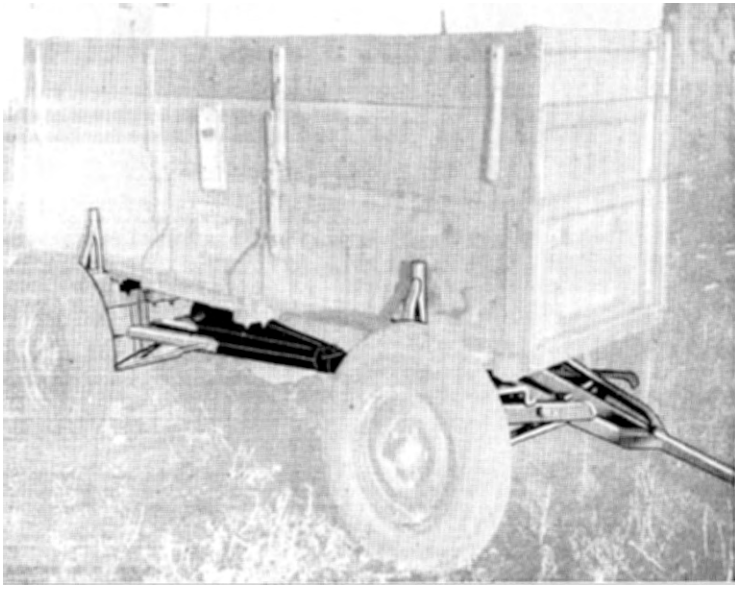
L. is the emergency door or bay through which foreign material can be removed.

If spare parts cannot be found to make the drum $\frac{3}{4}$ inch plyboard can be used. The elevator should be operated at a minimum of 2000 rpm's and a maximum of 3600 rpm's.

Farm Gate

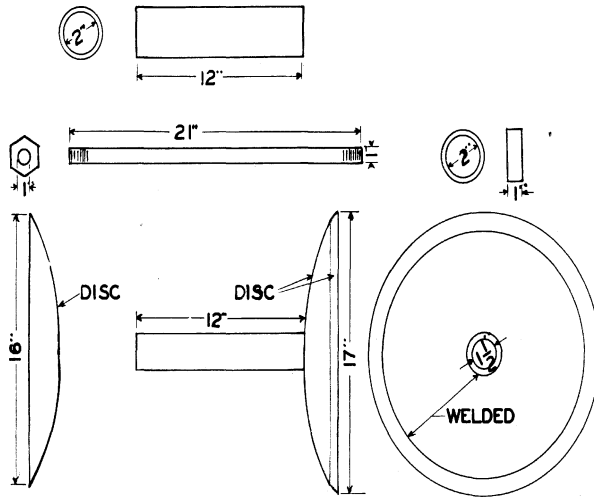
Much time and effort is lost in opening and closing a poorly designed gate. The plan of the farm gate shown in the drawing below is one of standard design. It is mounted on four hinges which provide for the gate standing open at certain angles without prop or weight and with a slight shove will close itself. Shown at the back is the hinge consisting of 2 car hinges welded together. The design to which the spring mechanism is attached consists of a strap iron approximately 14 inches long with a radius of $3\frac{1}{2}$ inches. The arm to which the spring is fastened securely is made of $1\frac{1}{2}$ inch angle iron welded to the gate post.





Wagon Trailer

Since the passing of the horse and buggy days and the entrance of the mechanical age many farm wagon chassis are standing idle. They can be converted into a practical usable farm trailer by removing the thimbles from the axle and installing front car axles on the lower side of the wooden axle by means of U bolts and equipping with pneumatic tires. By equipping the trailer with wheels and bearings of this type high speeds can be obtained without heating and friction.



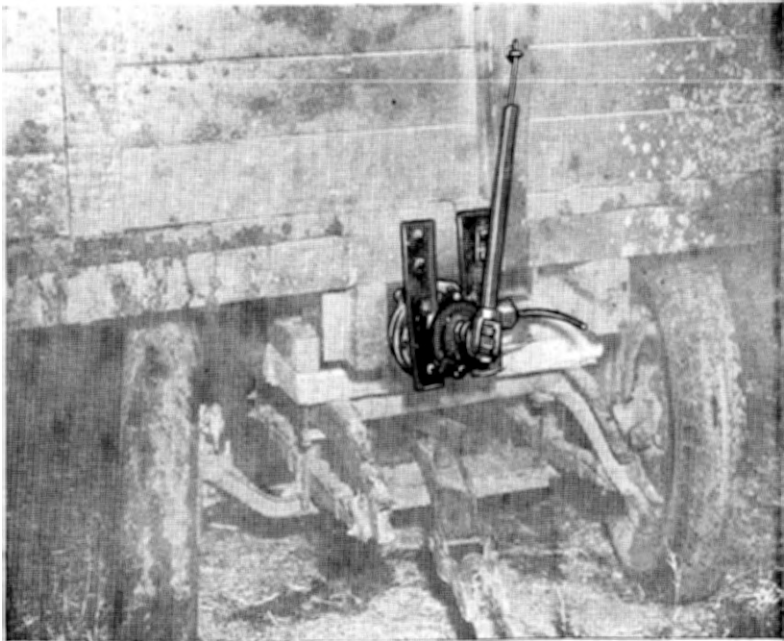
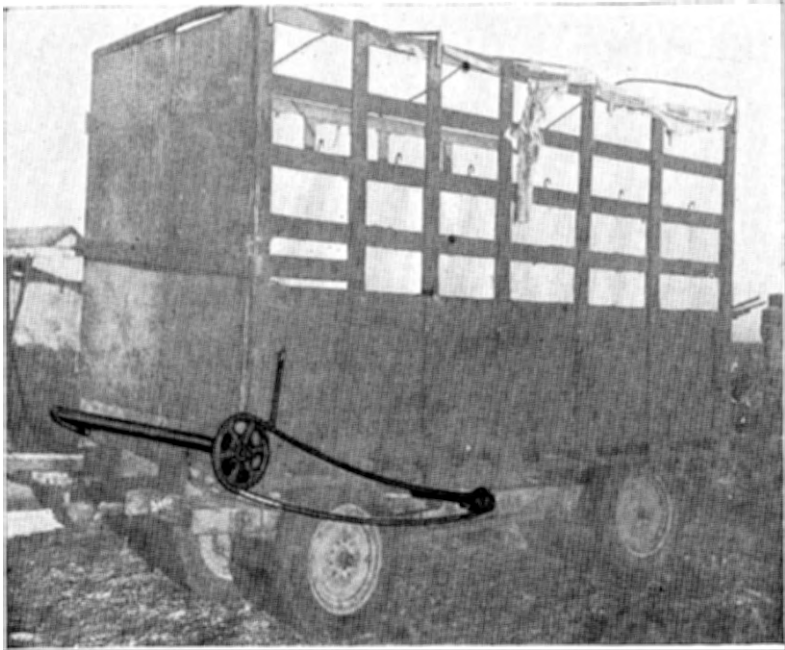
FENCE WIRE WINDER

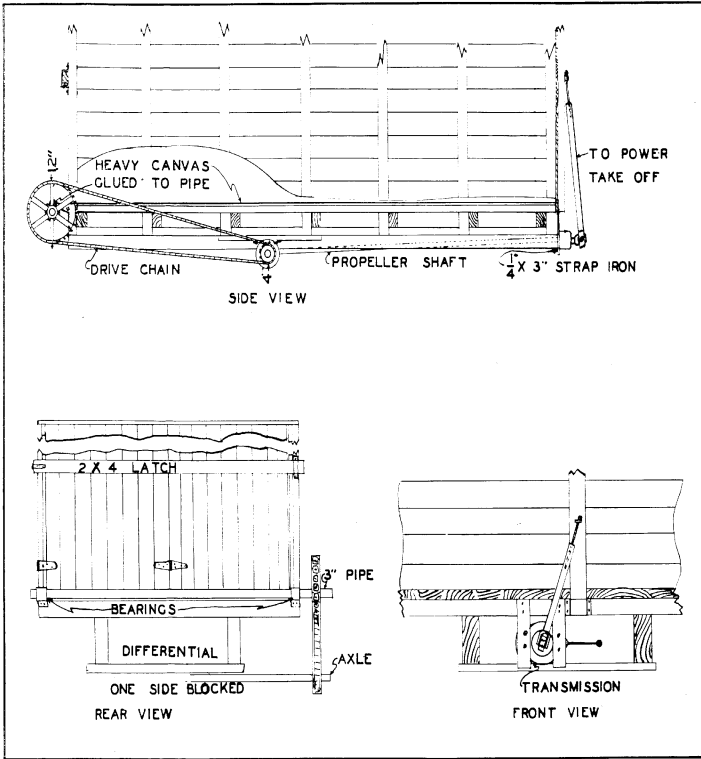
DEVELOPED BY JOHN DANNE - KINGFISHER

The fence wire winder can be made of two one way discs or go-devil discs. The inside disc should be reinforced by another disc slightly larger. The reinforcing is necessary to take care of the load that is developed on the spool at the time of winding long strands of barbed wire.

The spool consists of a 1 inch shaft threaded on both ends. One end of the shaft is screwed into a nut that is welded on to the hub cap and flange of the axle. A two inch pipe is placed around the shaft and the outside disc is placed on the shaft fitting snugly against the two inch pipe.

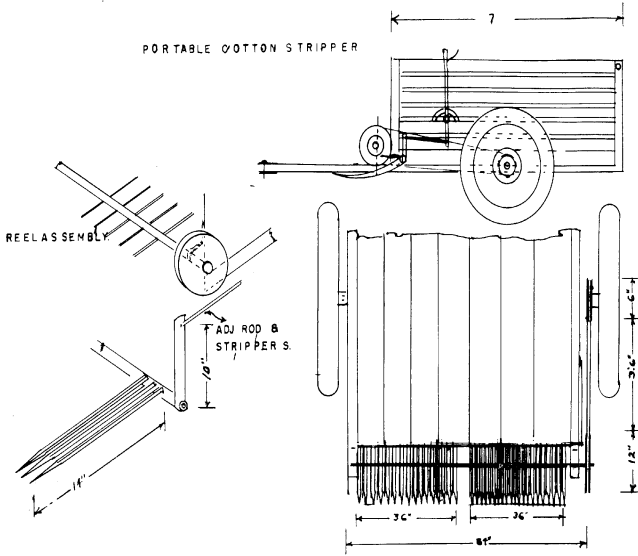
The spool is made fast by a lock washer and nut threaded on to the end of the shaft on the outside of the disc. A jack is placed under the rear wheel of the truck or tractor and the front wheels are blocked to prevent the truck from being pulled off the jack.





Silage Trailer and Unloading Device

A sturdy well built farm trailer is a convenient tool especially at feed harvesting time. The drawing of the trailer gives an idea how to construct a sturdy unit and install a fast and economical unloading device. The unloading device is nothing more than the transmission and differential of a used car plus a large roller mounted in bearings and equipped with a sprocket reel. The sprocket wheel on the roller is powered from the differential assembly. The unloading device is an extremely heavy canvas sufficiently large enough to cover the entire bed or floor. One end of the canvas is glued fast to the roller. The silage is blown into the bed on to the canvas and is unloaded into the pit or trench by engaging the power take-off. The power for this unit is delivered from the power take-off from the farm tractor.

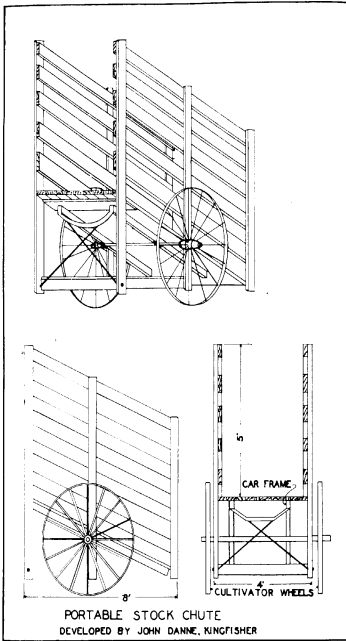


Portable Cotton Stripper

The portable cotton stripper is mounted on two 16 x 600 pneumatic tires. The stripper consists of nothing more than a farm trailer approximately 7 feet long 84 inches wide with stripper teeth welded on to an adjustable shaft so that the teeth can be raised or lowered with a lever to accommodate cotton stalks of varied height. A reel equipped with knockers, which is $\frac{1}{4}$ inch rod welded on to a 1 inch shaft and spaced in such a manner as to permit passage of the knocker rod between the teeth. This device tends to drive the cotton back in to the trailer and keep the teeth clean. The reel is powered by a pulley or sprocket wheel fastened to the inside of a trailer wheel, 8 inches in diameter and drives a pulley or sprocket wheel fastened to the end of the reel. A belt or chain can be used for transmitting power from the wheel of the trailer to the driver of the reel. The space between the stripper teeth is usually about $\frac{3}{4}$ of an inch.

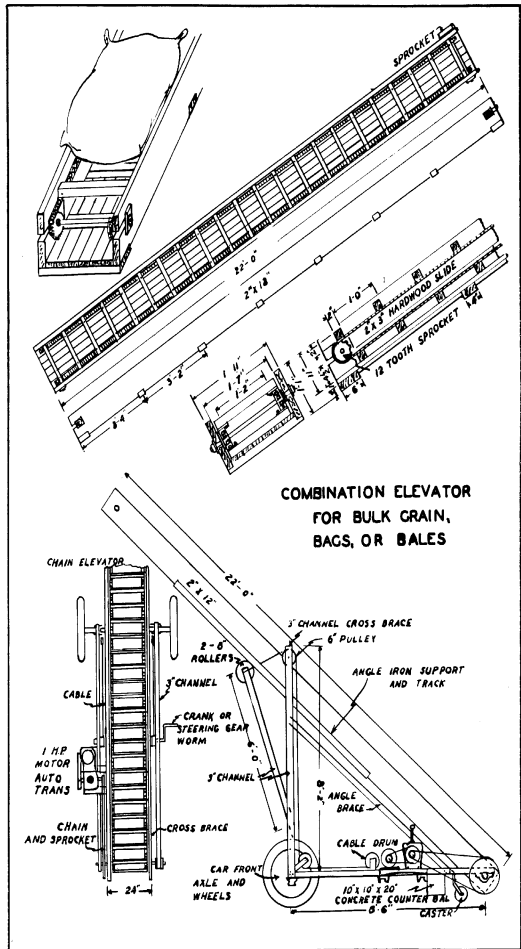
Portable Stock Chute

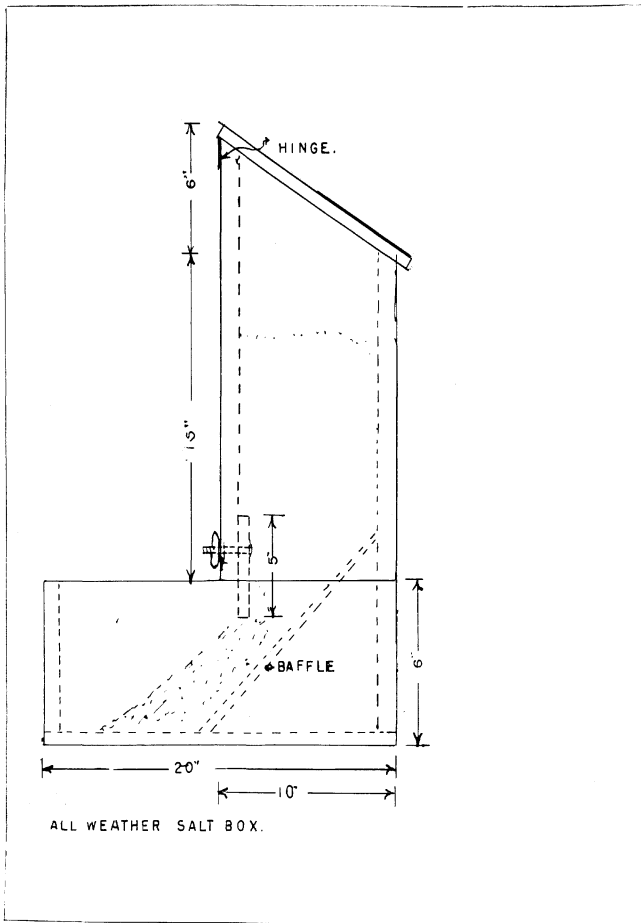
There are many types of portable livestock chutes. The one shown in the drawing was developed by John Danne of Kingfisher, Oklahoma. The chute is mounted on two riding cultivator wheels using an old car frame for a chassis. Most any kind of wheels that will withstand a thousand pounds of weight would serve as a means of transporting the chute around the barnyard.



Combination Elevator

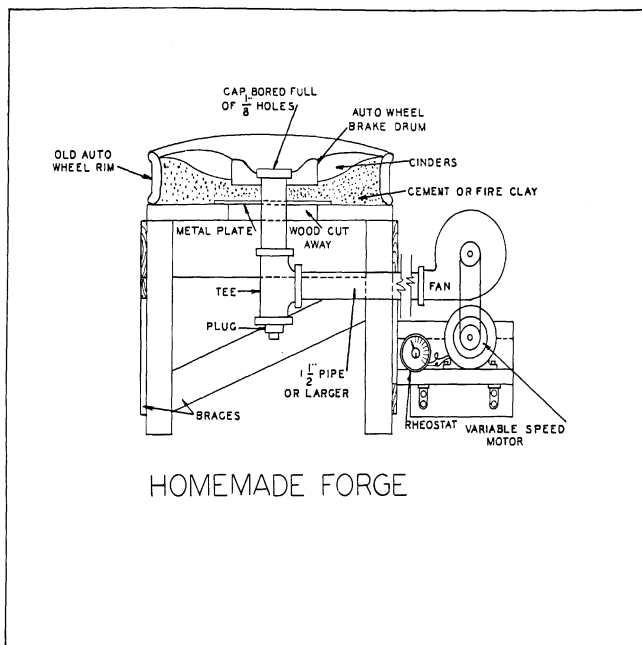
The combination elevator is for grain and baled hay. This elevator is an extremely practical device in that it will handle loose grain, grain in the sack, or baled hay. It is portable and it is not difficult to make. The accompanying plan gives sufficient details for its construction. However, one may have to vary slightly from the plan in order to utilize the material that he has on the farm.





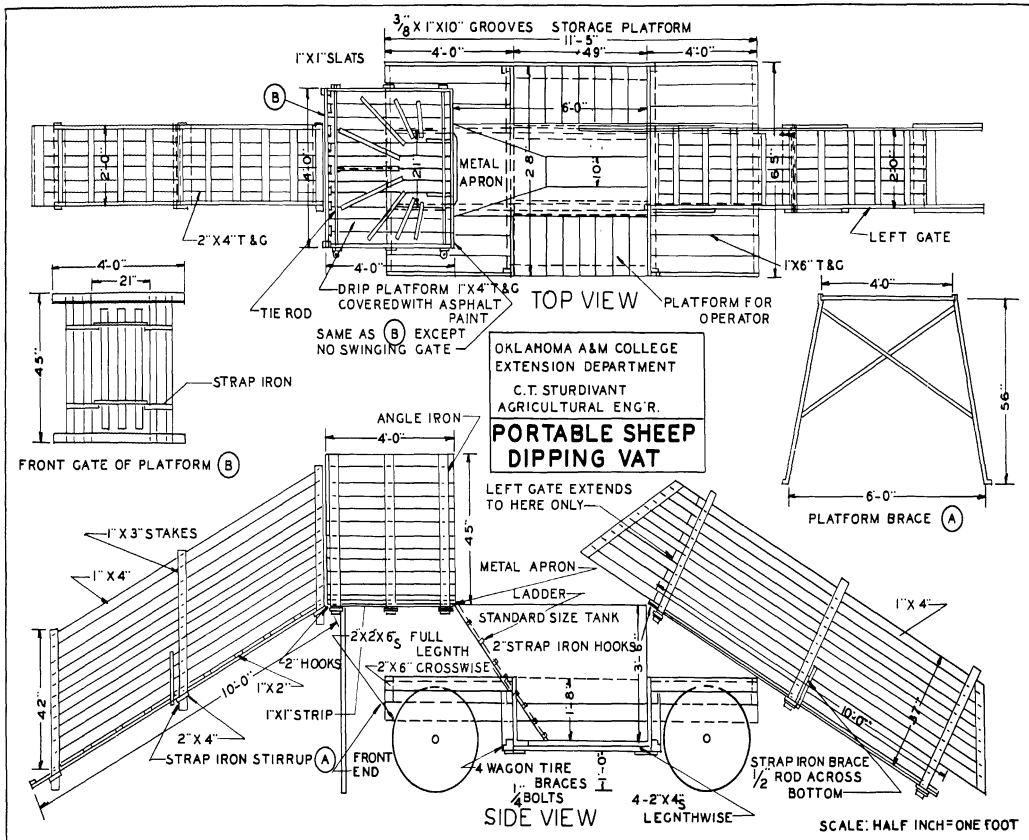
All Weather Salt Box

A practical salt box can be made from the suggested plan. This type of box has certain advantages over the open type box in that the excess supply of salt is protected from the weather. A baffle is placed in the salt box to cause the salt to slide out into the open box as it is used by the livestock. It may be necessary to jolt or jar the box occasionally to cause the salt to feed out into the open trough. The box should be fastened securely to a tree or post. It can be used for mineral mixtures as well as stock salt.



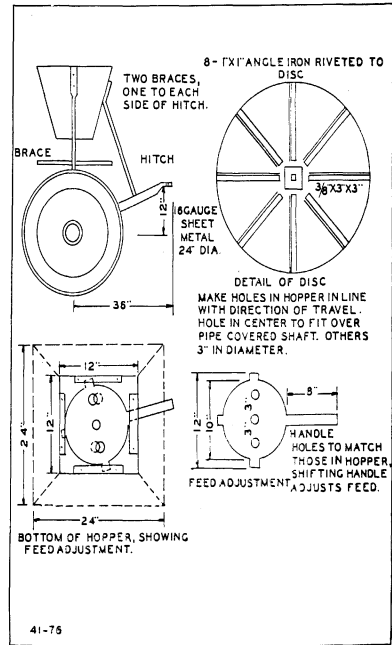
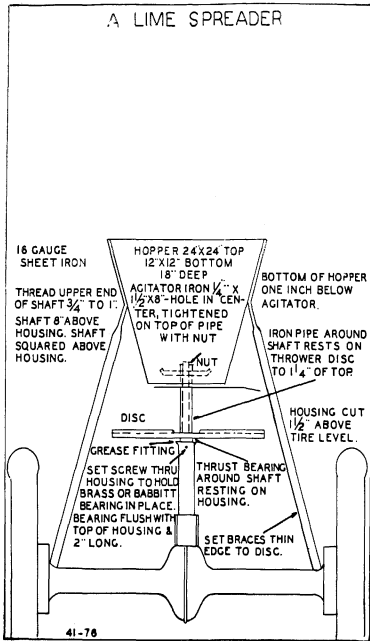
Homemade Forge

There are many different adaptations of the homemade power driven forge. The forge shown in this plan consists of an old corn planter wheel or a wheel of similar dimensions, into which is poured cement or fire-clay to furnish a floor for the fire. This is placed on to a table constructed of wood. The conduit for the air is made of 1½ inch pipe. The fan can be most any type of discarded enclosed fan. It may be necessary to replace bushings and bearings. The unit is powered with a variable speed motor in order that a rheostat can be attached. The homemade forge is a practical piece of farm equipment for farm shops.



Portable Sheep Dipping Vat

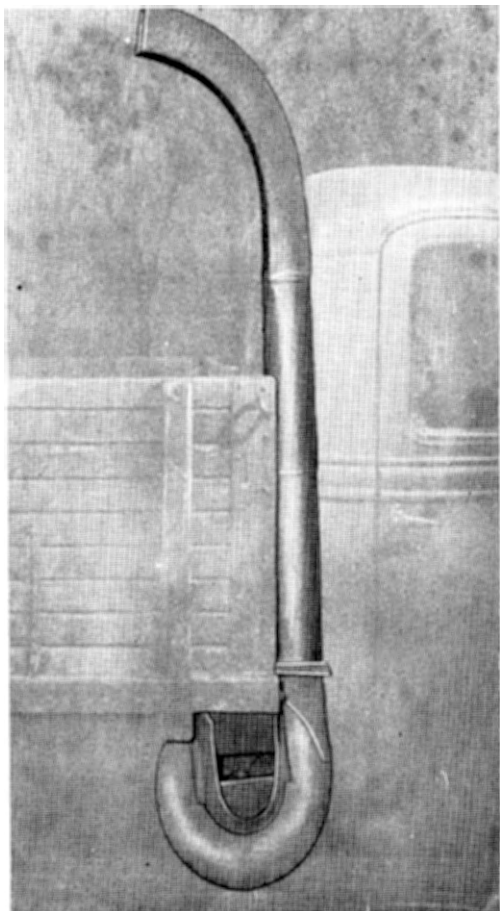
Since much time and effort is being spent on parasite control work the portable sheep dipping vat was developed. The attached plan gives sufficient detail for the construction of a vat. The farmer may have to vary from these plans in order to utilize the available material.



Lime Spreader

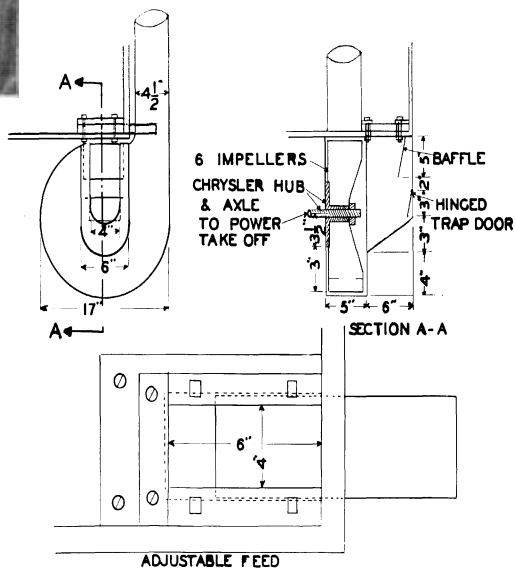
A practical lime spreader can be constructed from the plan shown and special care should be given to placing the thrust bearing around the short drive shaft. One will note that the power unit consists of the differential and rear wheel assembly of an old model car.

The adjusting plate in the bottom of the hopper determines just how much lime or phosphate that is being spread per acre. It will be necessary for the operator to do some trial spreading in order to know just where to set the adjustment.



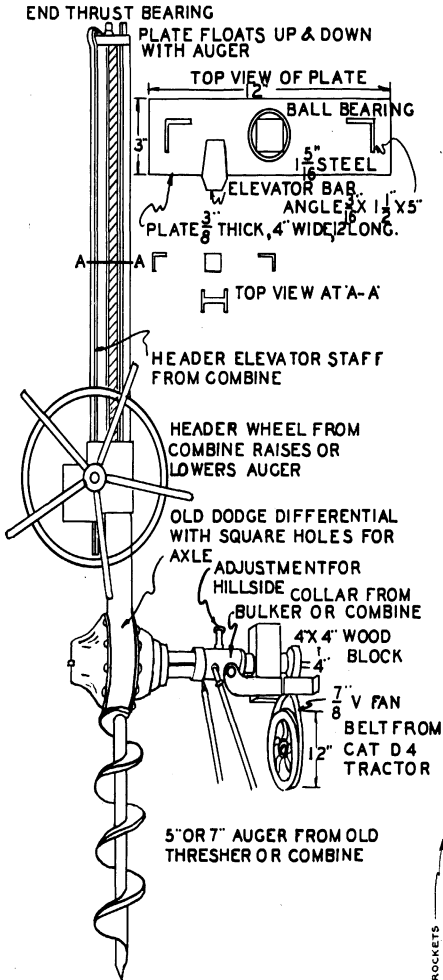
Air Blast Elevator

A number of different types of air blast elevators have been developed and it would be difficult to say just who developed the original idea. However, the plan shown in this publication is of an elevator being used by John Danne of Kingfisher, Oklahoma. It is mounted in the upper right hand corner of the pick-up truck bed with a sliding opening 4 inches wide and 6 inches long into the drum which is approximately 17 inches in diameter. The fan consists of six impellers welded on to a Chrysler hub and axle. The unit is powered by a power take off taken from the pick-up truck. Some of the elevators can be mounted on the rear end of the pick-up. It has a capacity of 8 bushels per minute and a vertical lift of approximately 10 feet.



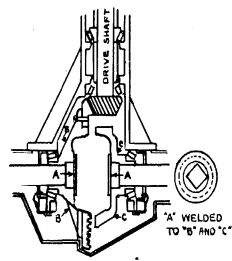
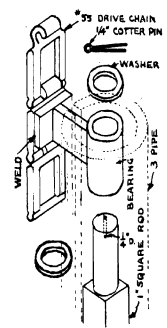
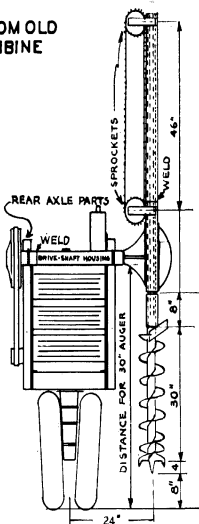
AIR BLAST ELEVATOR
DEVELOPED BY JOHN DANNE - KINGFISHER

POWER POST HOLE DIGGER

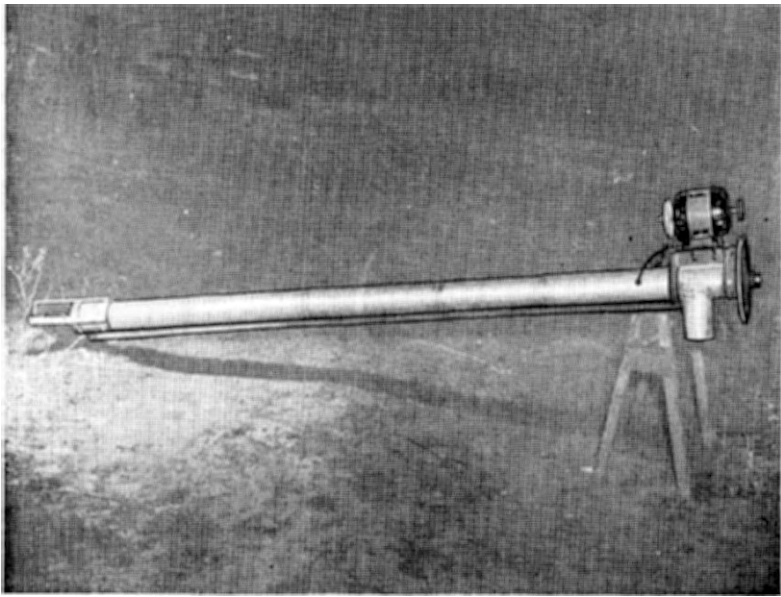


The Posthole Digger

Many types of posthole diggers have been developed. This plan shows the auger attached to the rear of the tractor extending far enough back of the rear wheels to enable one to make post holes for a fence that is already constructed or a line of holes can be established by driving the tractor astride of the proposed survey. We do not show the power lift on this unit but if a power lift is desired it could be developed by using two old car starters and rigging them up the same way as the power lift that is shown on the combine on page five.



ONE-MAN POSTHOLE DIGGER



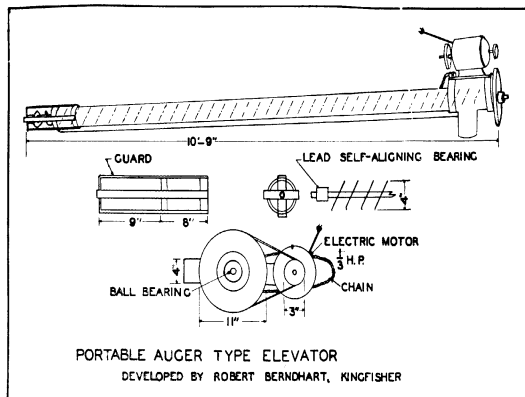
Portable Auger Type Elevator

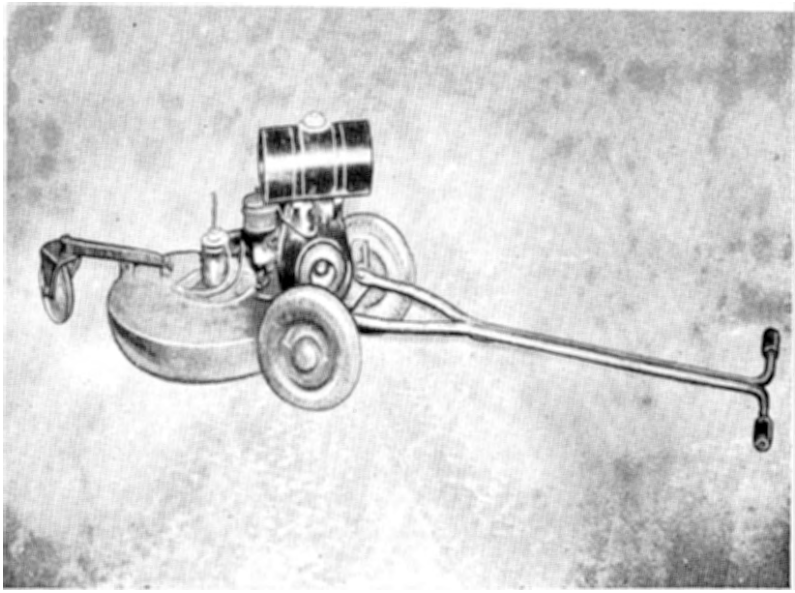
This elevator was developed by Robert Bernhart of Kingfisher, Oklahoma. It is extremely practical and inexpensive due to its extreme simplicity. This unit consists of an auger 4 inches in diameter taken from an old threshing machine or combine. The length should be approximately 10 feet long, and it may be necessary to weld two of these together to get sufficient length. The auger is fitted into a galvanized metal tube 5 inches in diameter. The shift of the auger is mounted into a bronze or self aligning bearing. A fin or guard about 14 inches long is placed over the lower end of the auger to hold the bearing in alignment and to reduce the danger of getting one's hand or clothing entangled in the auger.

Power is afforded by a one-third horse power electric motor equipped with a three inch driver and an 11 inch driven wheel mounted onto the end of the auger. This equipment is light in weight and can be moved readily and placed

into most any type of bin to remove the grain from the bin into the truck or trailer or it can be used to unload the grain from the truck or trailer into the bin.

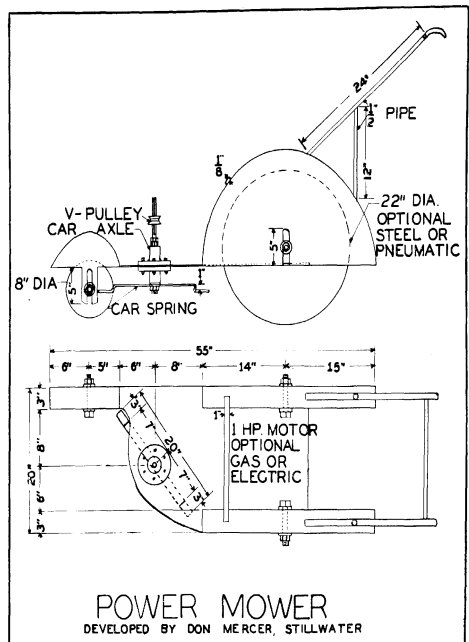
It will lift grain at the rate of seven or eight bushels per minute depending on the number of rpm's it is turning.

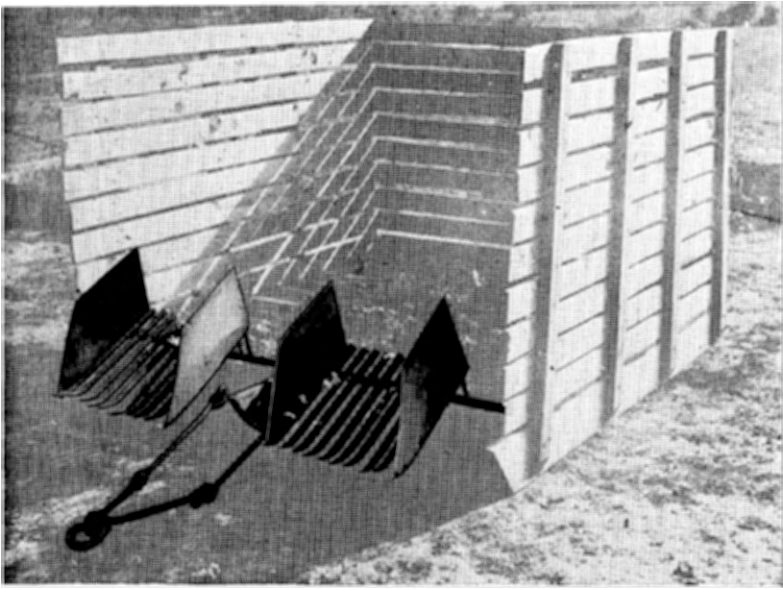




Power Mower

The power mower was developed by Don Mercer, machinist Stillwater, Oklahoma. Many requests have come to this office by county agents and farmers on how to make a power lawn mower. The attached plan shows how to construct one. This is a desirable plan in that the wheels have an adjustment for height and one side of the shield is cut away to enable close mowing to fences or foundations. It is powered by a one horse power gas or electric motor. The blade develops from 100 to 1200 rpm's. This is enough force to do a good job of cutting heavy grass or vegetative growth.



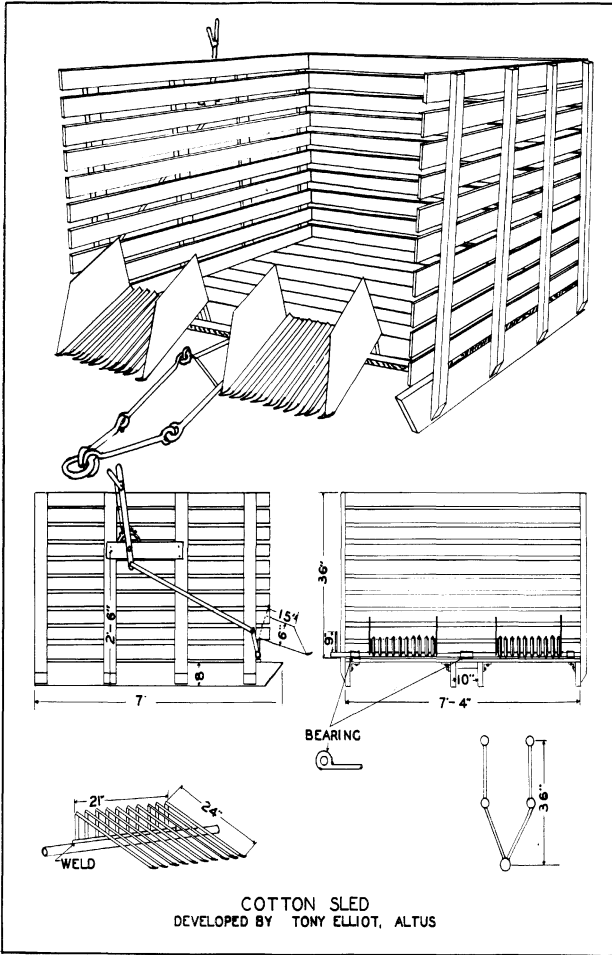


Cotton Sled

The two row cotton sled works very satisfactorily in cotton where the plant growth is not extremely heavy and on soils that are not extremely sandy. Many adaptations of the cotton sled have been developed in an attempt to do away with the drudgery of picking cotton by hand.

The one shown in the plan is about as practical as any of the sled type being used in the field today. Considerable care should be used in spacing the teeth of the stripping device. Some of the cotton sleds are equipped with a reel to move the cotton from the stripping teeth back into the bed of the sled, however, this one does not show that arrangement. The cotton is moved back by the use of a silage fork or a pitch fork.

A lever and adjusting device for the stripper is located on one side. The adjustment of the teeth will depend on the condition of the cotton. A one row sled can be constructed similar to the two row. However, the hitch will have to be so attached that it will not interfere with or drag down the cotton stalks before they come in contact with the stripper teeth.





The Homemade Bull Dozer

The bull dozer is designed primarily to move dirt with a row crop tractor. It is a practical tool to make small fills or dams up to 6 feet in height. A. is the lifting arm that connects the push rod with the power unit. It should be $\frac{1}{2}$ inch by $2\frac{1}{2}$ inches and approximately 10 inches long, welded on to a pipe approximately $1\frac{1}{2}$ inches in diameter indicated in the drawing as A-1.

B. two strap irons $1\frac{1}{2}$ x $2\frac{1}{2}$ inches approximately 12 inches long are used in making the lifting arm and should be welded to the pipe indicated as A-1.

A and B are welded to A-1 at approximately an 85 degree angle. Before welding is completed secure two pipes and the size should be such that the small one will fit snugly within the larger one indicated in the drawing as A-1 and B-1. This arrangement provides a boxing for the lift, allowing A-1 to turn within B-1.

B-1 is welded fast to the side clamps that are bolted on to the side of the tractor.

C. is four $\frac{1}{2}$ x $1\frac{1}{2}$ strap irons approximately 24 inches long will make the lifting bars for the blade.

D. is a used grade of moldboard with blade approximately 5 feet long depending on the size of the tractor.

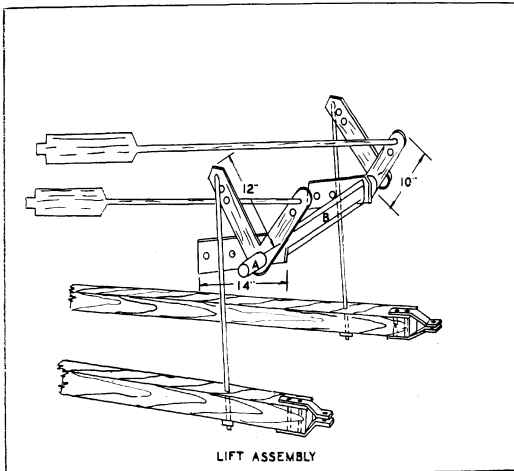
E. two strap irons $\frac{1}{2}$ x 2 inches approximately 14 inches long with sufficient adjusting holes to permit adjusting the angle of the moldboard.

F. two 4 x 4's of good sturdy material or 2 four inch pipes will make the push

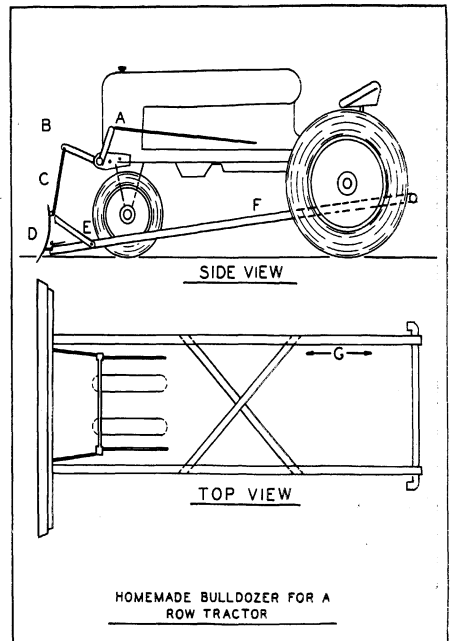
beams. No definite length can be given due to the different lengths of tractors. The length of the beam should be the distance from the draw bar hitch to a point approximately 8 inches in front of the front wheel.

G. two strap irons approximately 38 inches long $\frac{1}{2}$ inch thick and two inches wide should be bolted on to the push bars to provide a bracing affect.

If a grader moldboard cannot be secured the moldboard can be made of wood and faced with No. 16 gauge metal sheeting. When using the bull dozer sufficient wheel weights should be attached to the rear wheels of the tractor to prevent loss of traction.



LIFT ASSEMBLY

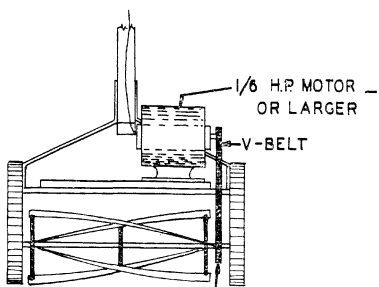


SIDE VIEW

TOP VIEW

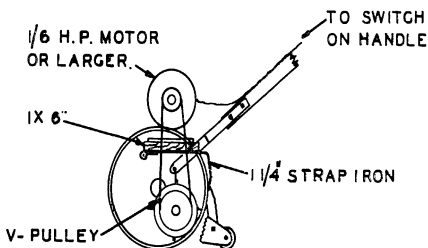
HOMEMADE BULLDOZER FOR A ROW TRACTOR

AN ELECTRIC MOWER



REMOVE END OF BLADE & MOUNT V-PULLEY ON BLADE SHAFT

—FRONT VIEW—



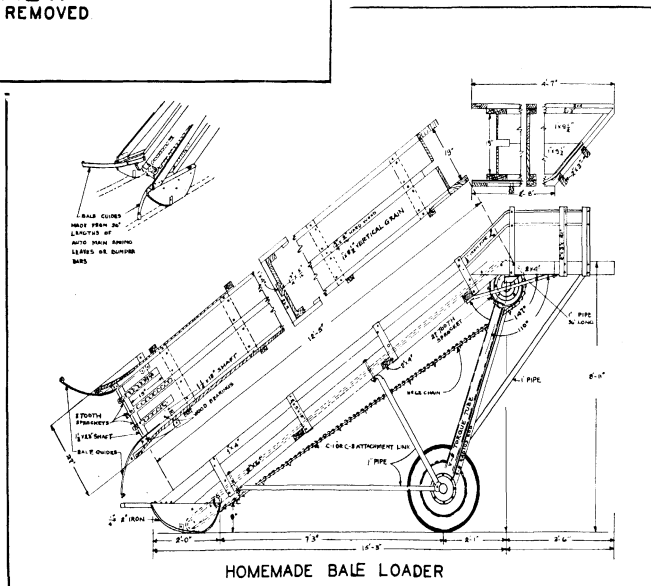
—SIDE-VIEW—
WITH WHEEL REMOVED

Electric Power Mower

This plan shows the assembly of an electric motor attachment on a standard hand powered lawn mower. A 1/3 horse power motor is desired and a power cord of not less than No. 12 wire should be used. In the event an electric motor is not available, a small washing machine motor can be attached in a similar manner as is shown in the plan.

Homemade Bale Loader

Since the invention of the pick-up hay baler much effort has been expended in trying to develop a bale loader that would pick the bales up from the ground without the aid of a man placing them in the path of the machine. This loader is equipped with bale guides that have a tendency to crowd the bale into the path of travel. The loader is mounted on old car wheels. It is well balanced and braced. It is powered by using a differential from the rear end of an old car.

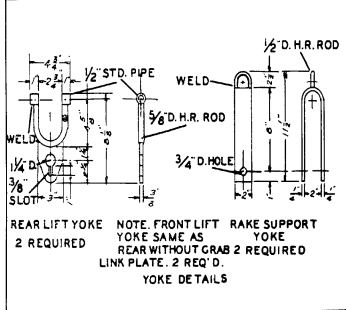
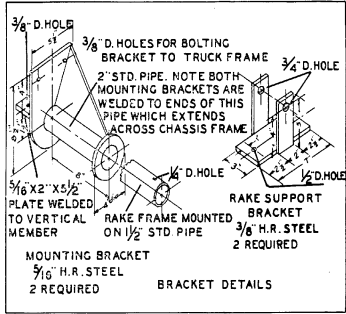
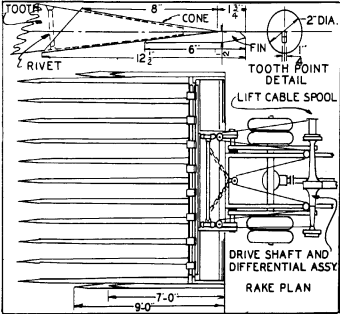
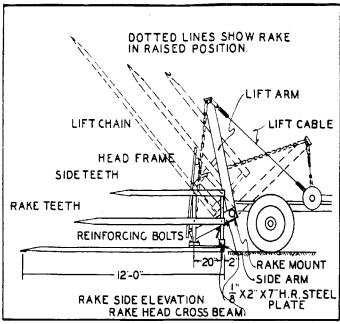


HOMEMADE BALE LOADER

Power Lift Buck Rake

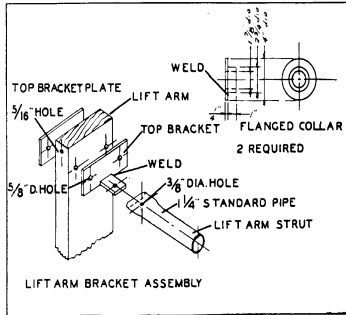
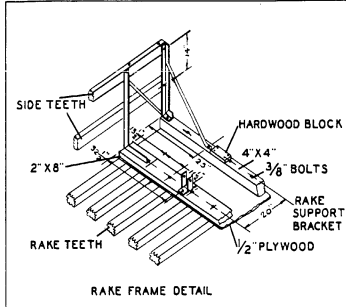
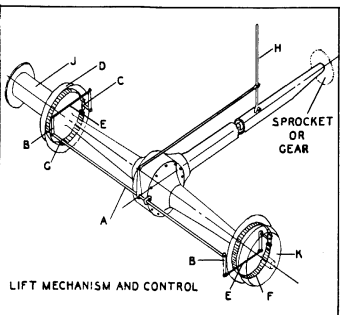
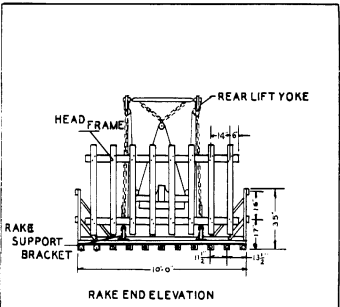
The buck rake shown in this plan is especially designed for long hauls, because the rake is attached to the rear end of an old truck or strip-down car and after the load has been collected the rake is lifted and the load transported to the barn by the car or truck.

The lifting device is developed by the differential of an old car and the rear wheel assembly. The differential is powered by a chain from a power take off or from a sprocket placed on the drive shaft of the car or truck. Special notice should be given to the drawing entitled lift mechanism and control. This device throws the lifting device in or out of gear.



Power Hoist

A substantial power hoist can be made by using the differential and drive shaft of an old car. Mount the differential on the rear end of a truck or a strip down car. Weld a 6 inch piece of pipe to one side of a car hub and on to the end of the 6 inch pipe, weld a flange this will provide for the cable or rope to stay in place. Attach a sprocket wheel on to the drive shaft and one on to the drive shaft of the car or truck. Connect the two with a steel power chain. This provides the power with which to operate the winch. Follow the suggested plan shown in the drawing in hooking up the breaking device. The hoist stem can be made of a 4 inch pipe fitted on to a smaller pipe. The smaller pipe being welded to the frame of the chassis. This will allow free swing and provide telescoping where additional height is desired.



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