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EC789 Converting Horse Drawn Mowers into Power Mowers

L. F. Larsen

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MANY farmers have experienced difficulty in obtaining sufficient new machinery for their use during the past few years, therefore many conversions and home made devices have been made to utilize more of the older machines.

Several horse mowers were checked for the pitman drive shaft speed and compared with that of tractor mowers. The average pitman speed of the horse-drawn mowers at three miles per hour was 850 revolutions per minute while several of the most common tractor mowers operated at a speed ranging from 830 to 880 revolutions per minute. This proved that it was entirely feasible to operate a horse-drawn mower by means of a power drive from the power take-off of the conventional tractor without seriously damaging any of the working parts.

This circular is concerned with the conversion of the horse-drawn mower so it may be adapted for better use with tractor power. The following figures illustrate simple methods of making mower hitches for tractor use and power take-off drive to pitman drive shaft.

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Many farmers pull one or two horse-drawn mowers behind their tractors. This tandem hitch illustrates one method.

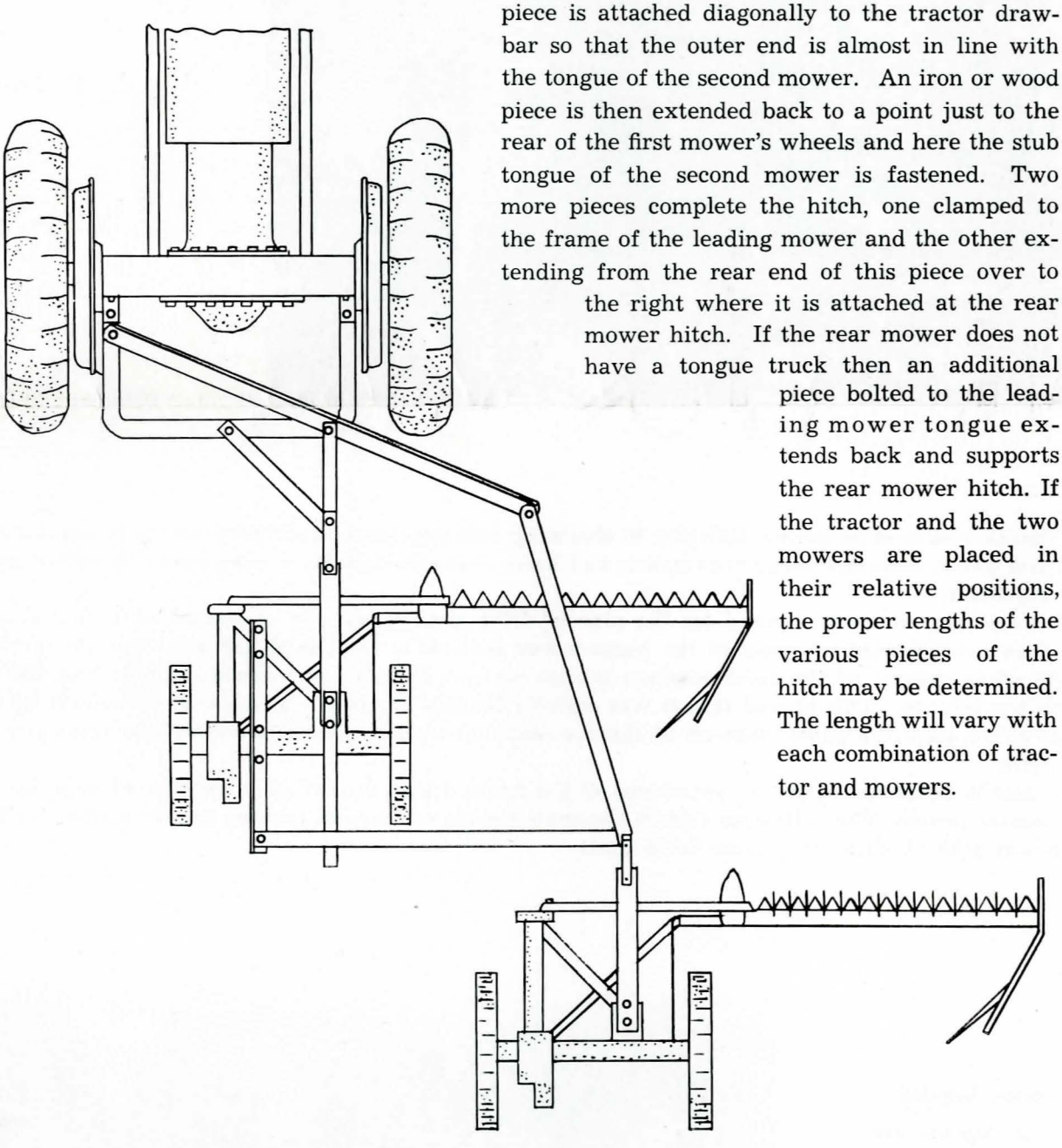


Figure 1 shows both mowers equipped with short tongues. The front mower is attached to a short extension of the tractor drawbar which may be made of heavy strap or angle iron. To pull the second mower, a heavy angle iron or hardwood piece is attached diagonally to the tractor drawbar so that the outer end is almost in line with the tongue of the second mower. An iron or wood piece is then extended back to a point just to the rear of the first mower's wheels and here the stub tongue of the second mower is fastened. Two more pieces complete the hitch, one clamped to the frame of the leading mower and the other extending from the rear end of this piece over to the right where it is attached at the rear mower hitch. If the rear mower does not have a tongue truck then an additional piece bolted to the leading mower tongue extends back and supports the rear mower hitch. If the tractor and the two mowers are placed in their relative positions, the proper lengths of the various pieces of the hitch may be determined. The length will vary with each combination of tractor and mowers.

Another type of hitch for pulling two mowers behind a tractor.

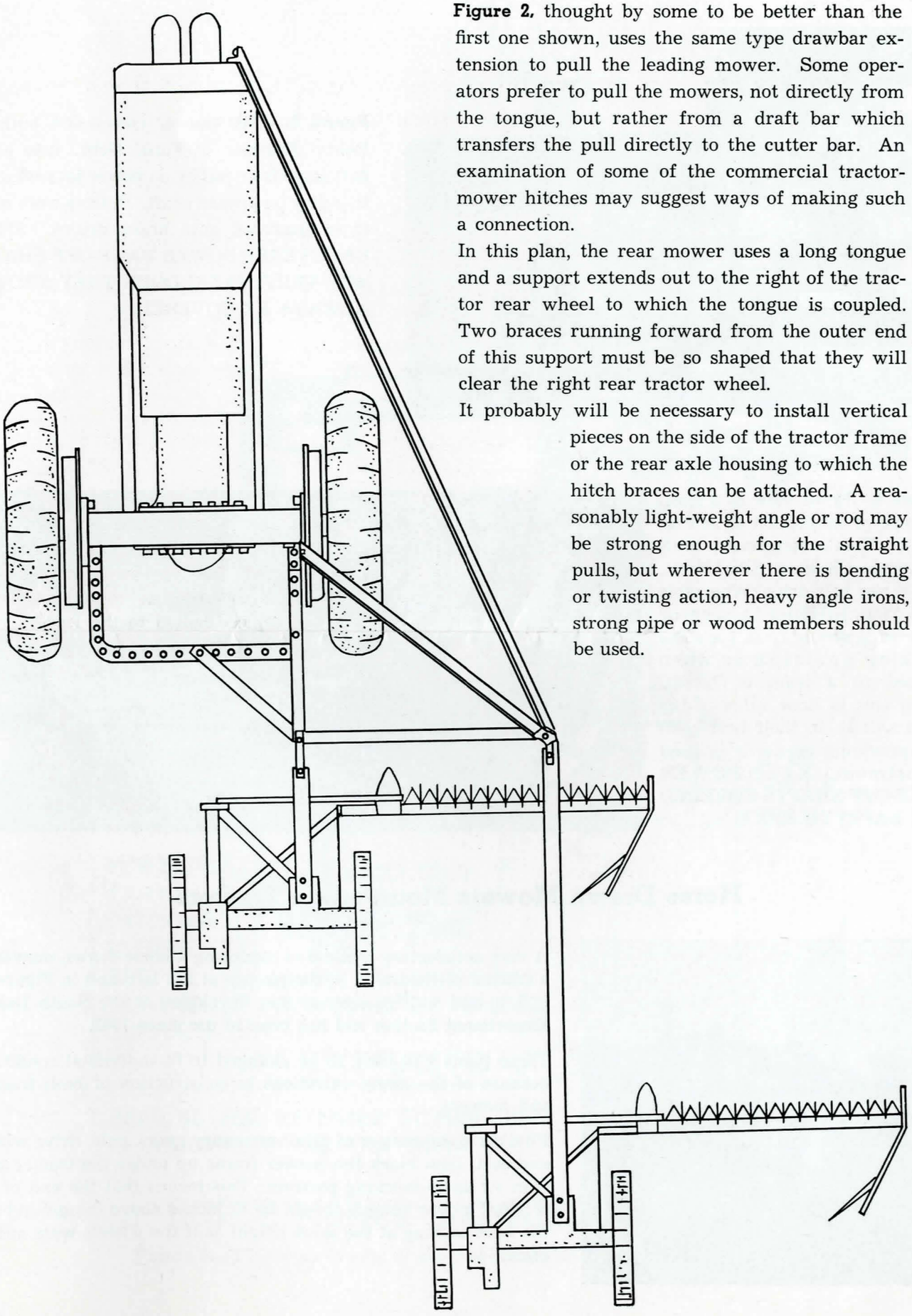


Figure 2, thought by some to be better than the first one shown, uses the same type drawbar extension to pull the leading mower. Some operators prefer to pull the mowers, not directly from the tongue, but rather from a draft bar which transfers the pull directly to the cutter bar. An examination of some of the commercial tractor-mower hitches may suggest ways of making such a connection.

In this plan, the rear mower uses a long tongue and a support extends out to the right of the tractor rear wheel to which the tongue is coupled. Two braces running forward from the outer end of this support must be so shaped that they will clear the right rear tractor wheel.

It probably will be necessary to install vertical pieces on the side of the tractor frame or the rear axle housing to which the hitch braces can be attached. A reasonably light-weight angle or rod may be strong enough for the straight pulls, but wherever there is bending or twisting action, heavy angle irons, strong pipe or wood members should be used.

Power Take-off Drive for Horse Drawn Mowers

Figure 3.—This mower conversion built by Robert Erickson of Funk, Nebr., uses a flat belt drive from pulley on power take-off drive to pulley on pitman shaft. Pulleys were made from discarded auto brake drums. SINCE UNCOVERED POWER TAKE-OFF SHAFTS ARE VERY HAZARDOUS THEY SHOULD ALWAYS BE COVERED.

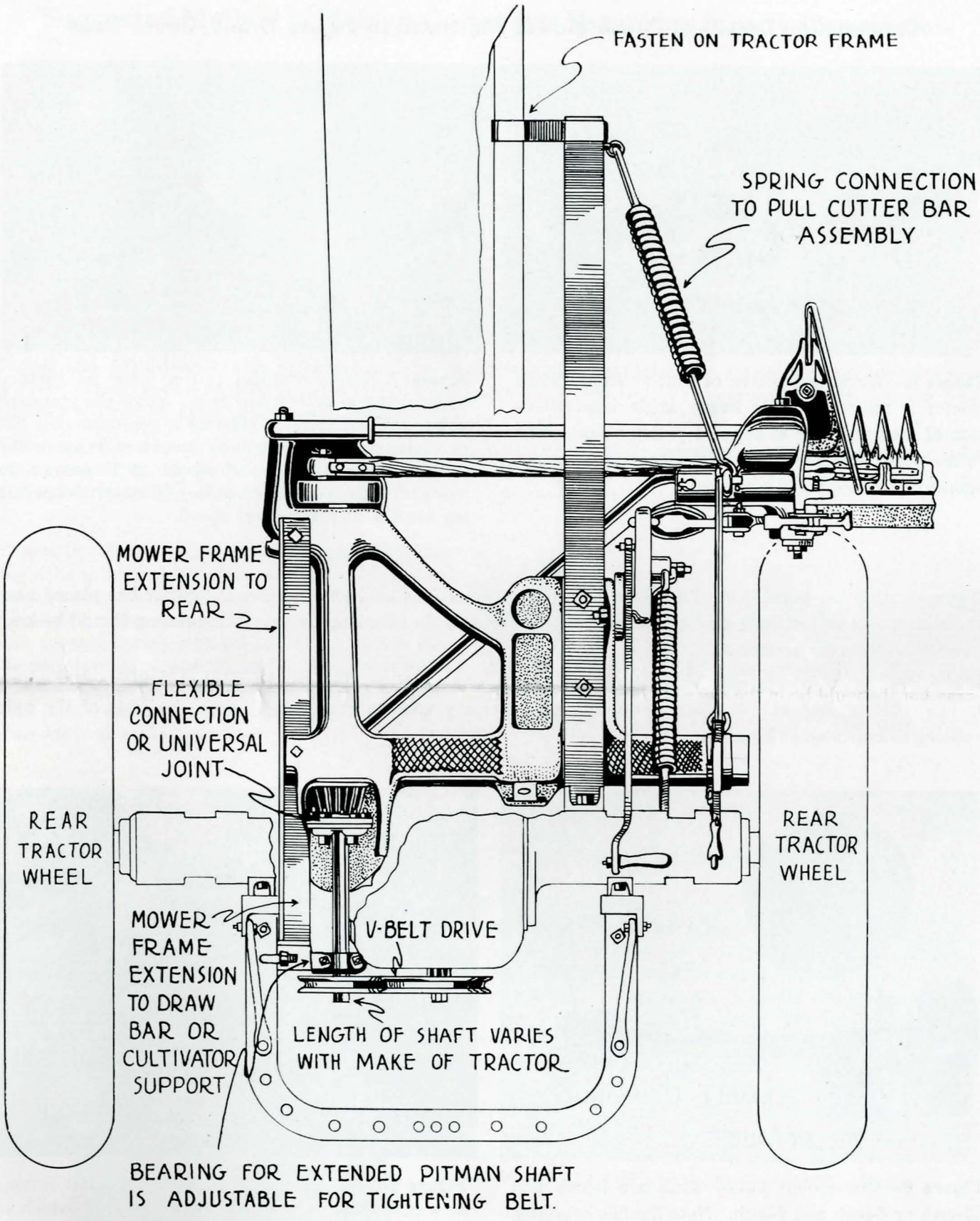
Figure 4.—Front view of a similar type of conversion as in Figure 3. This arrangement built by Leonard Koenig, Ellis, Nebr., uses a vee belt drive. When this mower is hitched to tractor drawbar it should be in the same working position as when hitched to a team of horses. When this is done all working parts will be in their best position providing mower is in good adjustment. KEEP POWER TAKE-OFF SHAFTS COVERED FOR SAFETY'S SAKE.

Horse Drawn Mowers Mounted on Tractors

A very satisfactory method of mounting a horse drawn mower on a tractor is illustrated in the picture at the left, and in Figures 5, 6, 7, 8, and 9. This method was developed at the South Dakota Experiment Station and has been in use since 1942.

These plans will have to be changed to fit individual conditions because of the many variations in construction of both tractors and mowers.

First strip the mower of all unnecessary gears, axle, drive wheels and seat, then block the mower frame up under the tractor so it is in its usual working position. This means that the end of the original mower tongue should be 32 inches above the ground and the axle housing at the same height as if the wheels were still in place.



OLD HORSE MOWER MOUNTED TO TRACTOR

Figure 5.—This is a drawing of the power mower shown on the cover page.

Canstruction Details of Power Mower Illustrated in Figure 5 and Cover Page

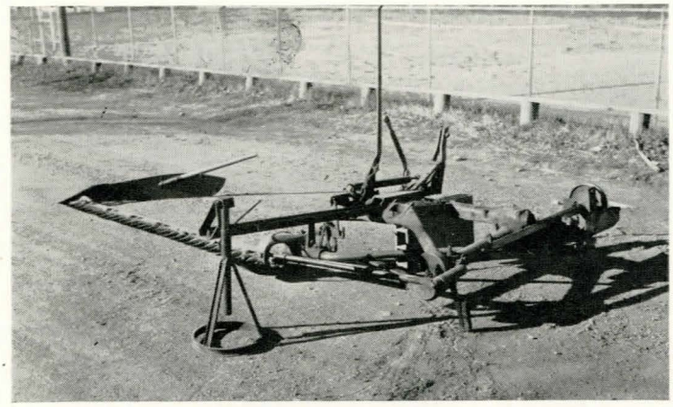


Figure 6.—Working position of mower frame when tractor is removed. Note heavy angle iron extension of mower frame to support pulley wheel. The lifting lever was bent to a convenient position for operator. No foot pedal is needed.

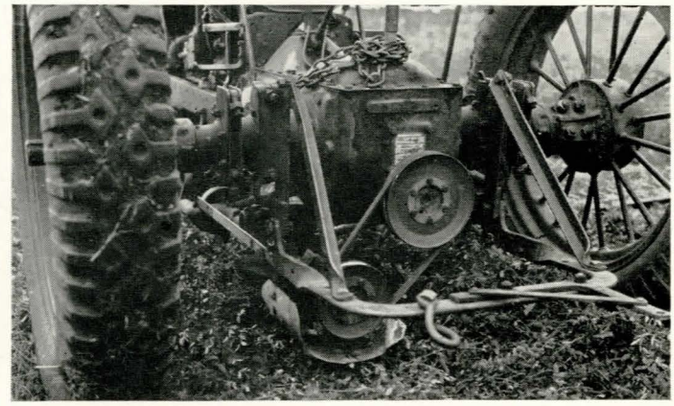


Figure 7.—Belt drive has proven very satisfactory when using a ¾-inch vee belt. Since the standard power take-off speed of tractors is approximately 550 revolutions per minute it is necessary to have the pulley on power take-off about 50% greater in diameter than the driven pulley in order to operate the mower at the correct speed.

When locating the position of the mower under the tractor it is advisable to have the cutter bar placed near the rear wheel to facilitate ease of turning square corners. In all cases the rear axle housing should be kept parallel to the rear tractor axle.

It has been found convenient to provide a stub tongue mounted on the side and parallel to the tractor frame as one point of support. Two other supports are necessary, one on each end or near the ends of the axle housing as indicated in Figure 5.

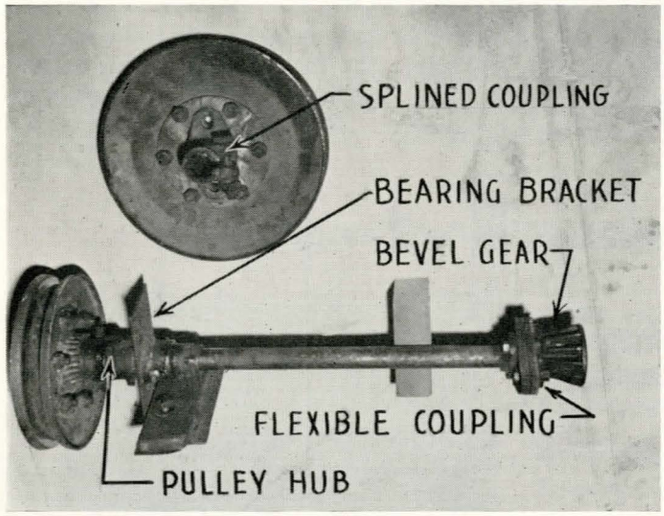


Figure 8.—Convenient pulley sizes are 8-inch and 12-inch or 6-inch and 9-inch. Note flexible coupling, roller bearing, and pulleys. The shaft is a 1-inch steel shaft. The flexible coupling could be an old auto universal joint or flexible fabric coupling as used on some of the older autos.

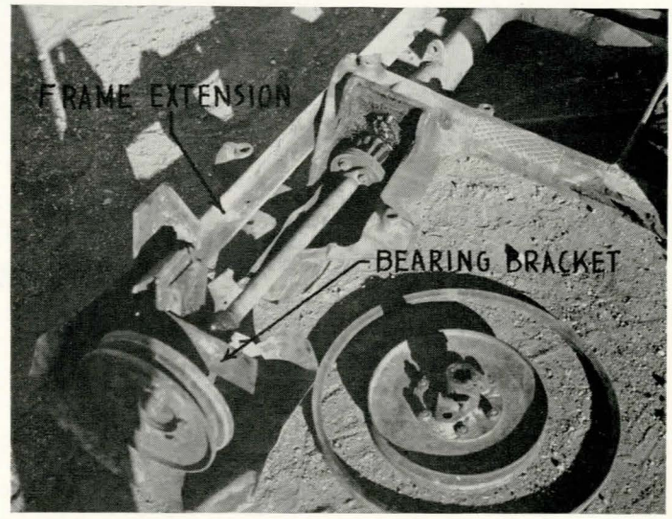


Figure 9.—The pulley end of the drive shaft rotates in a self aligning one-inch roller bearing which is supported by an adjustable bracket as in Figure 8. This bracket is mounted on a support in such a manner as to provide an up and down adjustment to permit the necessary belt adjustment. In all cases make supports extra strong as all mowers have a tendency to vibrate.

Suggested Method of Making Cutter Bar Extension for any Conversion

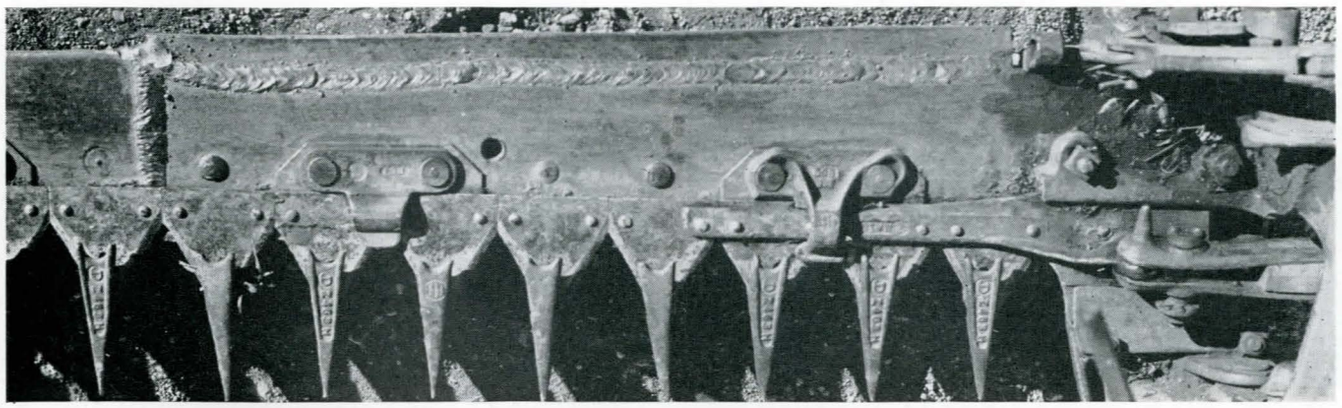


Figure 10.—Since many horse mowers have only a 5-foot cutter bar, which is rather short for tractor use, a 2-foot extension can be welded on to make a 7-foot cut. This practice is recommended only when a good welding job can be done by an experienced welder.

This type of extension for cutter bar can be used on any of the mowers described in this circular. The weld may be made on the outer end of cutter bar with good success, but putting the extension on the inner end and reinforcing it as shown in Figure 10 will make a stronger bar, and require less reinforcing.

Figure 11.—It is a recommended practice to bevel the ends to be welded and bolt the two pieces on another cutter bar until one side has been welded completely. This permits true alignment and correct spacing between guard-bolt holes. When the welding job is finished the cutter bar should have a slight curvature as indicated on the cover page. This is to make possible a straight bar when lowered to operating position.

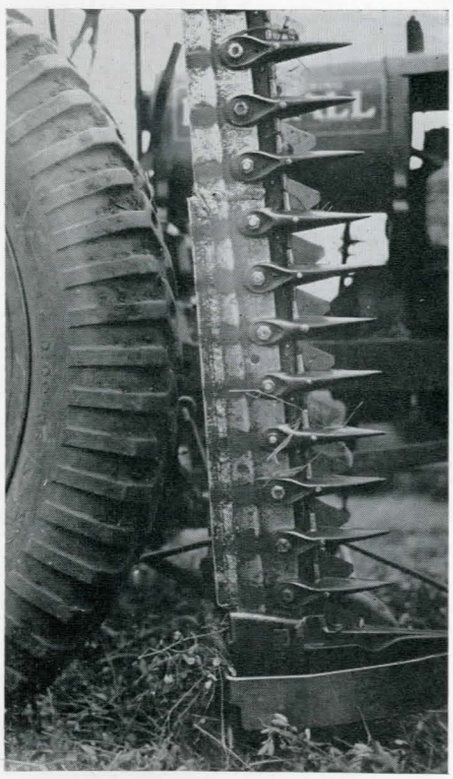


Figure 12.—The illustration at the left shows how the extended cutter bar looks after a season's use on the power mower shown on the cover. If the extension is correctly welded and reinforced, and the spacing and alignment is accurate, such a sickle bar should be as serviceable as other parts of the converted mower. Since the picture was taken, this cutter bar has been used three additional seasons. It is possible to mow more hay per day with the home made power mower shown on the cover and in Figure 5 than with two five foot horse drawn mowers. Since the cost of a new sickle or knife is not great, it is advisable to buy a new one rather than extending an old one.

Trailer Type Mower Conversion

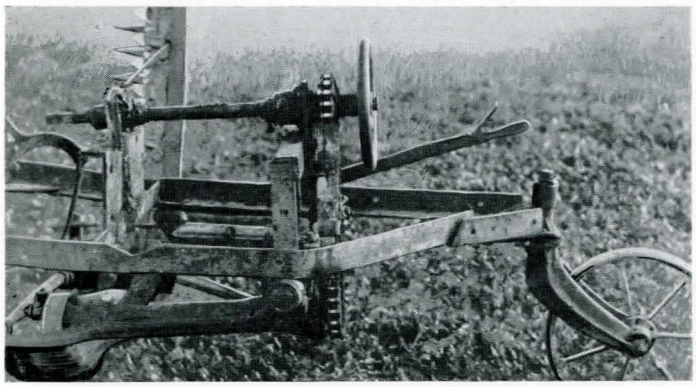


Figure 13.—This shows how the power drive shaft, from an old corn picker, was mounted above the mower. POWER TAKE-OFF SHAFT SHOULD BE COVERED. (Figure 13 and 14.)

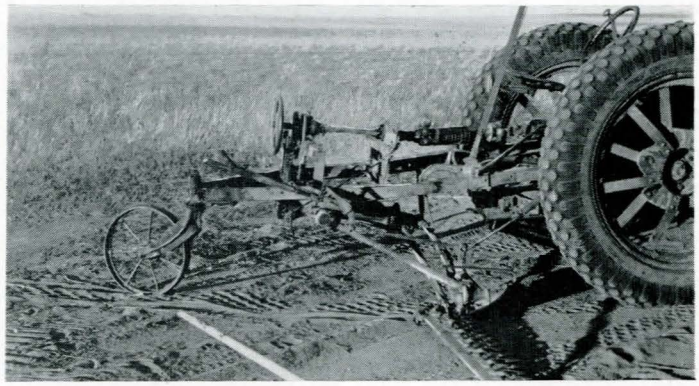


Figure 14.—This shows the mower built by Gerald Greenamyer, Gordon, Nebr., mounted on the tractor. This mower, built at a very low cost, has been in use several seasons.

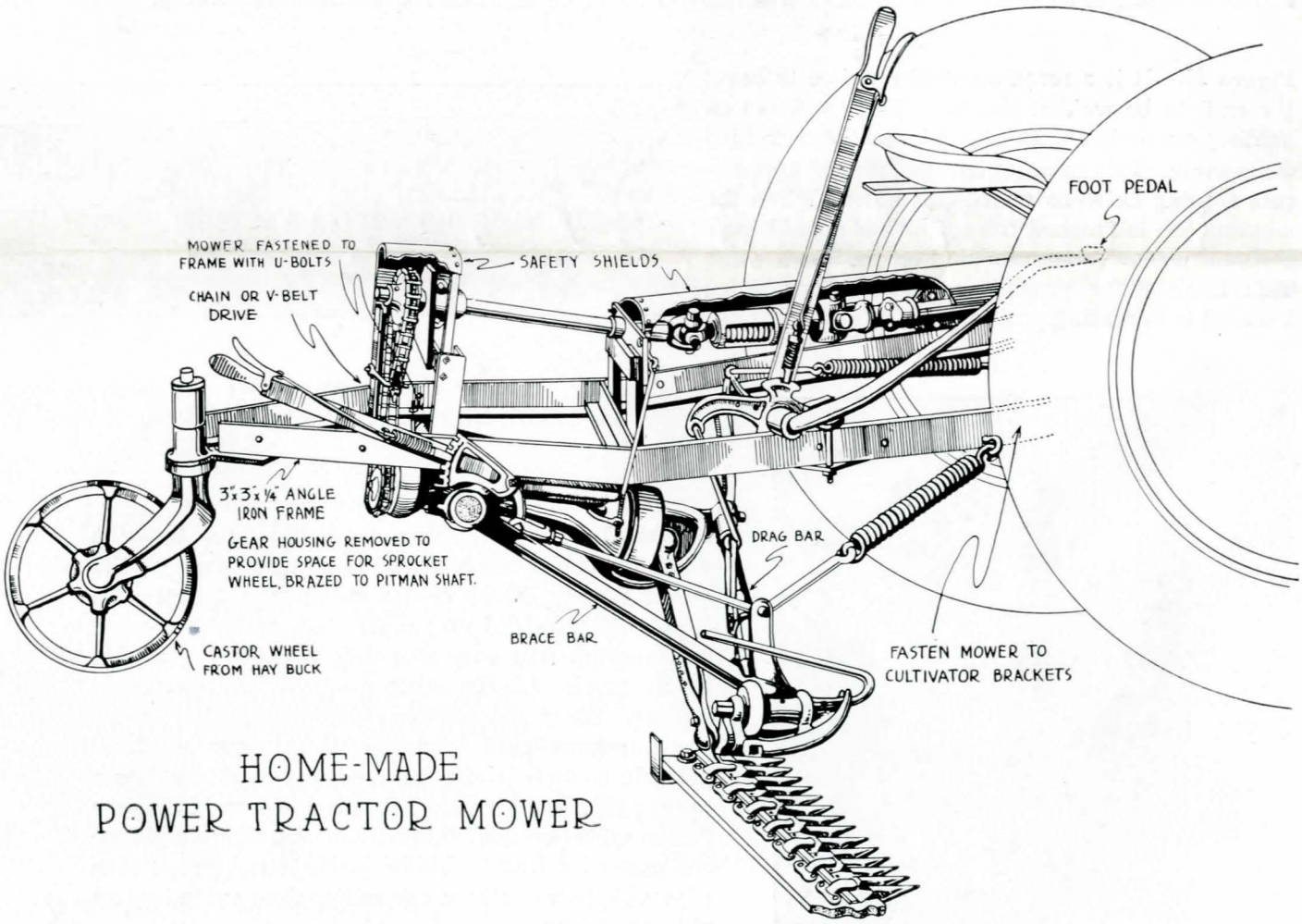


Figure 15.—This is a trailer type of mower which has proved very satisfactory. Note the heavy angle iron frame extending back from cultivator brackets on tractor rear axle.

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