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Circular 44 February, 1943

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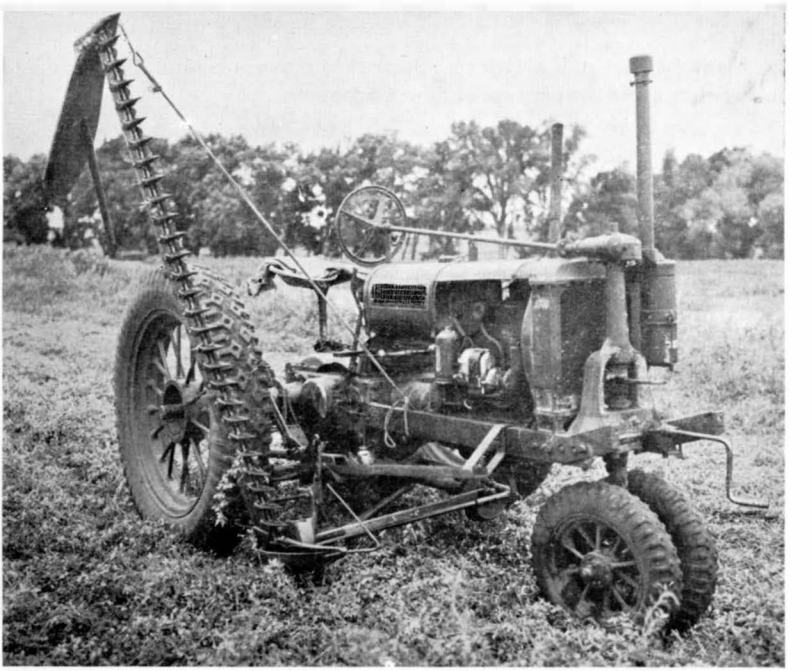

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Converting A Horse-Drawn Mower Into A Power Mower

By L. F. Larsen

Rapidly increasing use of tractor power has made it necessary for many farmers to discard horse-drawn machinery even though it still is usable. The mower is a good example of a machine which can be adapted for use on tractors.

Many farmers pull one or two horse-type mowers behind their tractors as in Fig. 1 to avoid the expense of new machinery.

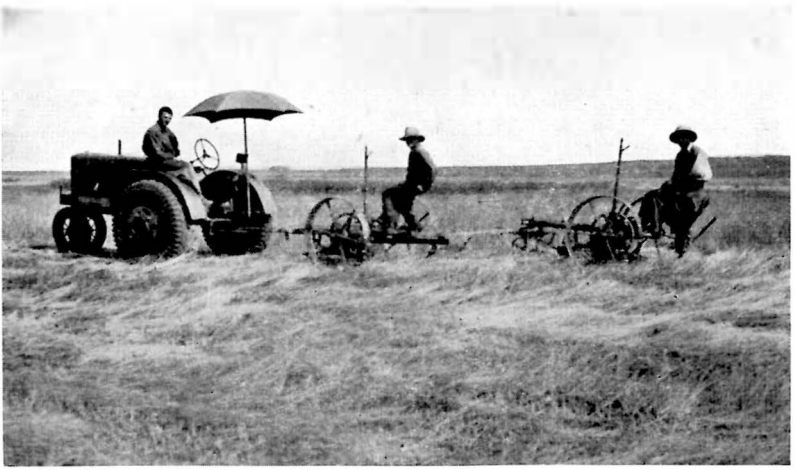

Fig. 1. Two horse-drawn mowers pulled by a tractor.

The South Dakota Experiment Station was interested in making better utilization of horse-drawn mowers and investigated the possibility of mounting these machines on tractors so they could be driven by the power take-off.

Several horse mowers were checked for the speed of the pitman drive shaft and compared with that of tractor mowers. The average speed of the horse-drawn mowers at 3 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 oper-

ate a horse mower by means of a power drive from the power take-off of the conventional tractor.

A mower was mounted on a tractor and later revised in several ways until a satsifactory arrangement was constructed, as illustrated on cover page, at a cost of less than $15 for material and welding. This mower was tested during the summer of 1942 by a farmer living near Brookings. Other similar mowers have since been constructed for use on other makes of tractors as well.

No exact plans can be set forth because of the large variations in different makes of tractors and mowers but the following procedure is recommended for those who are interested in this type of mower.

First, strip the mower of all unnecessary gears, axle, drive wheels and seat. Then block the mower frame up under the tractor so that 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 (See Fig. 2).

When locating the position of 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 of the axle housing or thereabouts.

As the average standard power take-off speed of tractors is approximately 550 revolutions per minute it is necessary to have the pulley on the power take-off about 50 percent greater in diameter than the driven pulley, as in Fig. 3, in order to run the mower at a proper speed.

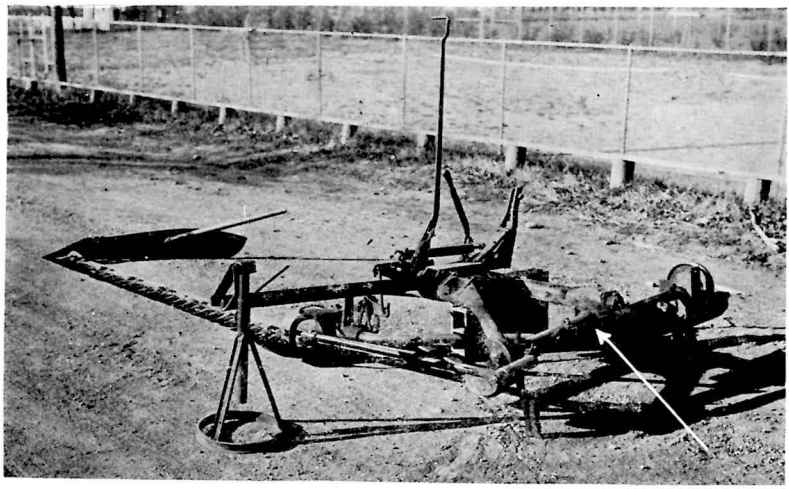

Fig. 2. Working position of the mower frame. Note the heavy angle iron extension of mower frame to support pulley wheel. The lifting lever was bent to a convenient position for operator. No foot pedal was needed.

Fig. 3. Belt drive has proven very satisfactory when using a ¾-inch Vee belt. Convenient pulley sizes are 8-inch and 12-inch or 6-inch and 9-inch. Note how frame extension is mounted on drawbar with one ⅝-inch bolt. A shield is necessary to keep hay from getting in pulley or on shaft.

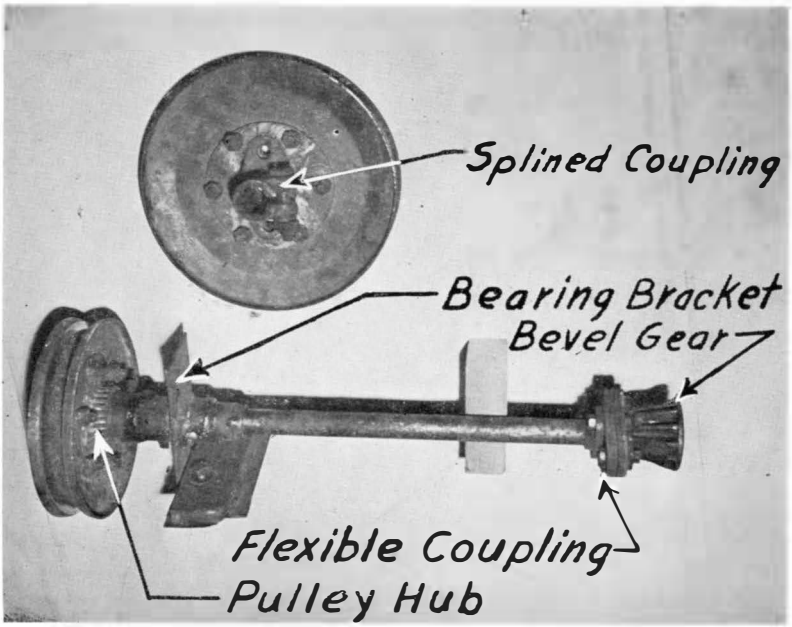

Fig. 4. Illustrating flexible coupling, roller bearing and pulleys. Small pulley is 7 inches in diameter and keyed to shaft. Large pulley is 10 inches in diameter and is fastened on a splined sleeve for power take-off.

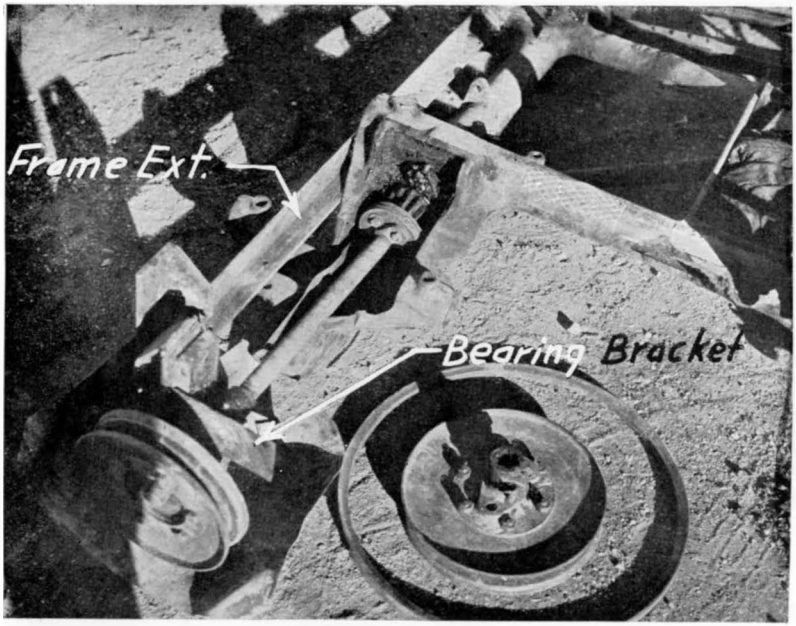

Fig. 5. Power drive shaft with flexible connection on pitman bevel gear, roller bearing pulleys and belt.

A one-inch cold rolled steel shaft is most suitable for connection between smaller pulley wheel and flexible coupling attached to the small bevel pinion on the pitman drive shaft as in Fig. 4.

This flexible coupling could be an old auto universal joint or made similar to the flexible coupling used on an F-14 steering shaft as illustrated in Fig. 5, but made with ⅜-inch bolts and heavy belting in place of the usual webbing provided.

The pulley end of the drive shaft rotates in a self-aligning one-inch roller bearing which is supported by a bracket as in Figs. 4 and 5. This bracket is mounted on a heavy angle iron extending from the mower frame in such a manner as to provide a slight up and down adjustment. This is necessary to permit the tightening of the drive belt.

In all cases it is recommended to make the frame work and supports extra strong as all mowers have a tendency to vibrate.

Many horse mowers have only a 5-foot cutter bar which is rather short for tractor use. Therefore a 2-foot extension was welded onto the original cutter bar as illustrated by Figs. 6, 7 and 8 and tested during the summer of 1942 with satisfactory results.

By referring to Fig. 2 and Fig. 9 it may be noted that the cutter bar lies straight on the ground, whereas when the cutter bar is raised as on the cover

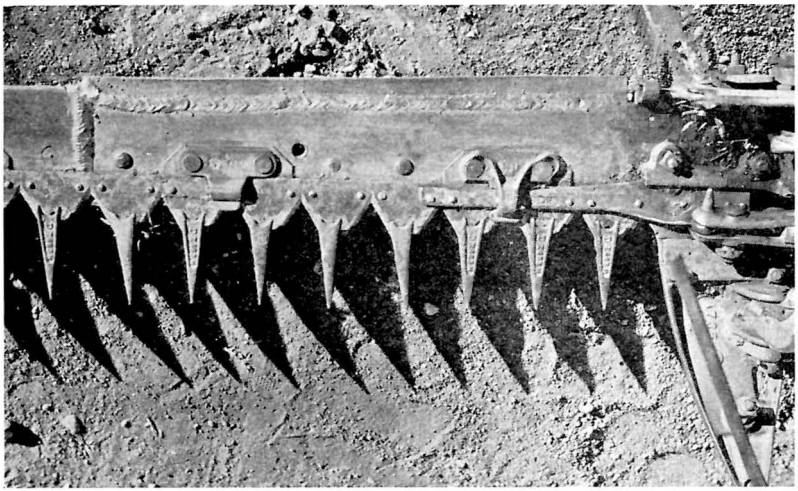

Fig. 6. Two foot extension welded on inner end of cutter bar. This practice is recommended only when a good job of arc welding is possible.

page the bar has a slight curvature. This curvature is necessary to allow the bar to lie parallel to the ground when the cutter bar is lowered and the lifting spring becomes tight.

Many farmers prefer the trailer type of mower. Therefore, one was constructed from an old horse mower as illustrated by Figs. 9 and 10.

Although this mower operated satisfactorily, it was much more complex and expensive to build. It's main advantage was ease of attaching but all operators preferred the simpler type of mower as it was much more convenient to operate in the field. Even though the first mower had no safety release hitch, it was located in front where the operator could easily watch the mower at all times.

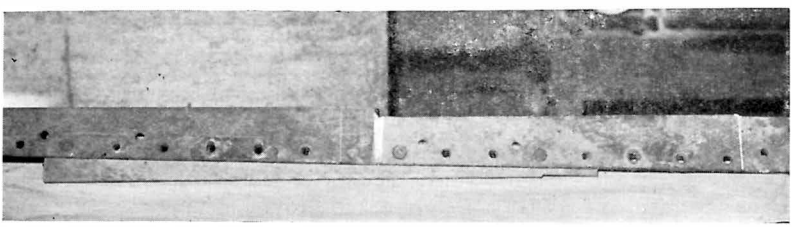

Fig. 7. It is a recommended practice to bevel the ends to be welded and bolt the two pieces on another cutter bar until one side has been welded completely. This permits true alignment and correct spacing between guard bolt holes.

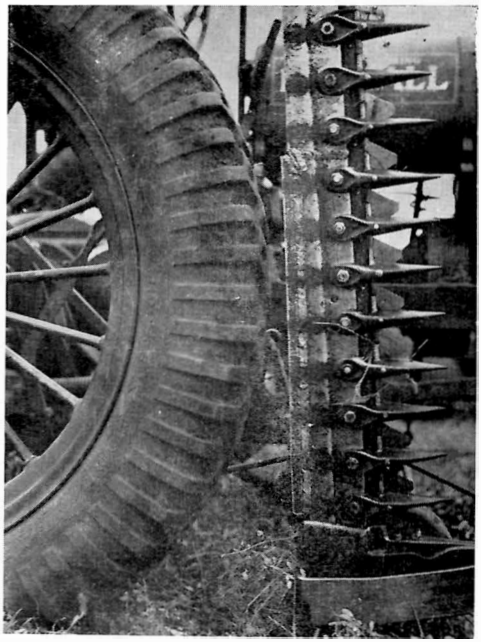

Fig. 8. Extended cutter bar as used during the summer of 1942. The welded extension can be placed on either end of the cutter bar with equal success.

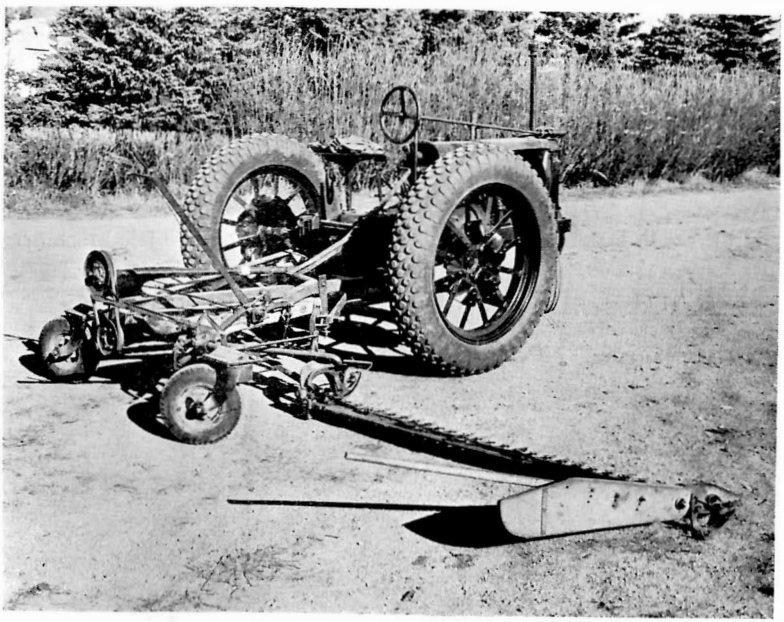

Fig. 9. Seven-foot trailer type mower with safety release hitch.

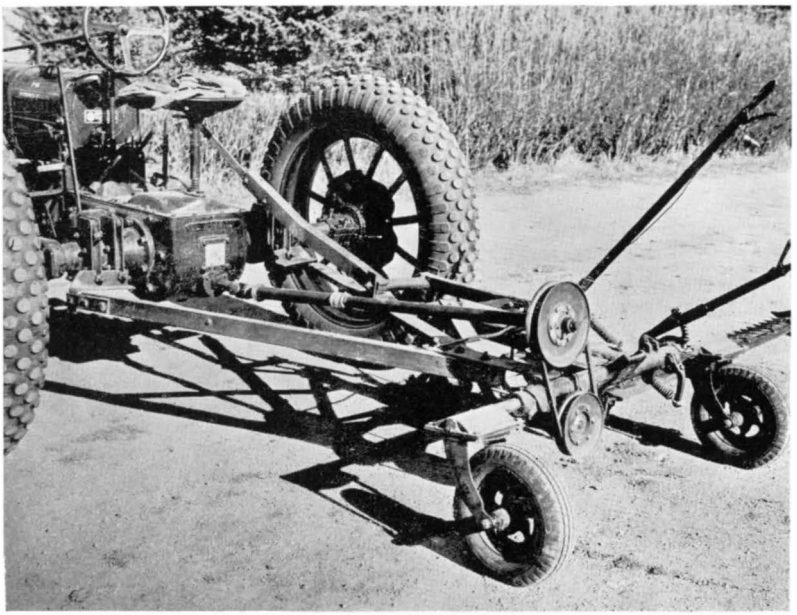

Fig. 10. Showing power drive arrangement and hitch.

Agricultural Engineering Bulletins
of the South Dakota Agricultural Experiment Station on Field Machinery as of May 1, 1943

Other related publications from this station pertaining to the better utilization of horse-drawn machinery are as follows:

No. 297 Hitches for Field Machinery

No. 303 Two-Row Cultivator Converted Into a Weed Control Machine

No. 30 Simple Two-Binder Hitch and Homemade Windrower