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Homemade Windrower and Two-Binder Hitch

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Home Made WINDROWER *and* TWO-BINDER HITCH

A Simple Chain Hitch For Two Binders

AGRICULTURAL ENGINEERING DEPARTMENT
AGRICULTURAL EXPERIMENT STATION
SOUTH DAKOTA STATE COLLEGE--BROOKINGS

Introduction

Tractors are rapidly replacing horses for pulling farm machinery leaving many farmers with old machines which have no further use unless they can be remodeled for use with tractors.

It is the purpose of this circular to present suggestions that will aid the farmer in remodeling these machines for power farming.

Further experimentation will be done with other machines.

List of Illustrations

Home Made Windrower and Two-Binder Hitch

By L. F. Larsen

A Simple Two-Binder Hitch

A simple inexpensive method of hitching two horse-drawn binders behind a tractor should appeal to South Dakota farmers who raise large acreages of small grain. The need for such an arrangement has been evidenced by the large number of inquiries received by the Agricultural Engineering Department of the South Dakota Agricultural Experiment Station. The inquiries prompted the department to try various methods of hitching binders. The hitch arrangement shown in Figs. 1 and 2, and described on the following pages, is the plan used by the college farm for the past three years. It has proven most satisfactory.

Only two chains or cables are needed and very little time is required for assembly of this hitch if the following instructions are followed:

1. If one binder is smaller than the other, use the smaller machine ahead if possible.

2. Use a stub tongue on the first machine and hitch directly to tractor drawbar as illustrated by sketch in Fig. 1. Use tongue truck on the rear machine.

3. Set the machines in the proper position for operation in the field, with the stub tongue or pole strap of the rear machine trailing the rear edge of the front machine, a distance at least as great as the cut of the first machine, so when corners are turned the binders will not interfere with each other. This distance should never exceed the width of the cut of the first machine by more than one foot. Fig. 1 shows by sketch how to set the binders while assembling the hitch. In this particular case, a 7 foot and an 8 foot binder are hitched together.

4. With the binders in this position the chains or cables can be laid out in position. When using a chain it may be necessary to join some lengths of chains together, as one chain needs to be at least 24 feet long (see Fig. 1). The exact length will, of course, depend upon the size of binders, tongue lengths, etc. In absence of anything better, chains can be joined together simply by using a bolt through the end links.

5. The long chain or cable should be held in place by two slip joints underneath the front binder; otherwise, the chain or cable will interfere with the working parts of the binder. A slip joint should be placed at both front and rear parts of front binder as shown by "A" and "B" in Fig. 1. The chain must be free to slide in these slip joints when turning. In Fig. 3 the arrow indicates

Acknowledgement: The material concerning the two-binder hitch is the result of experimental work done by D. E. Wiant, formerly of this Station and now with the Michigan State College.

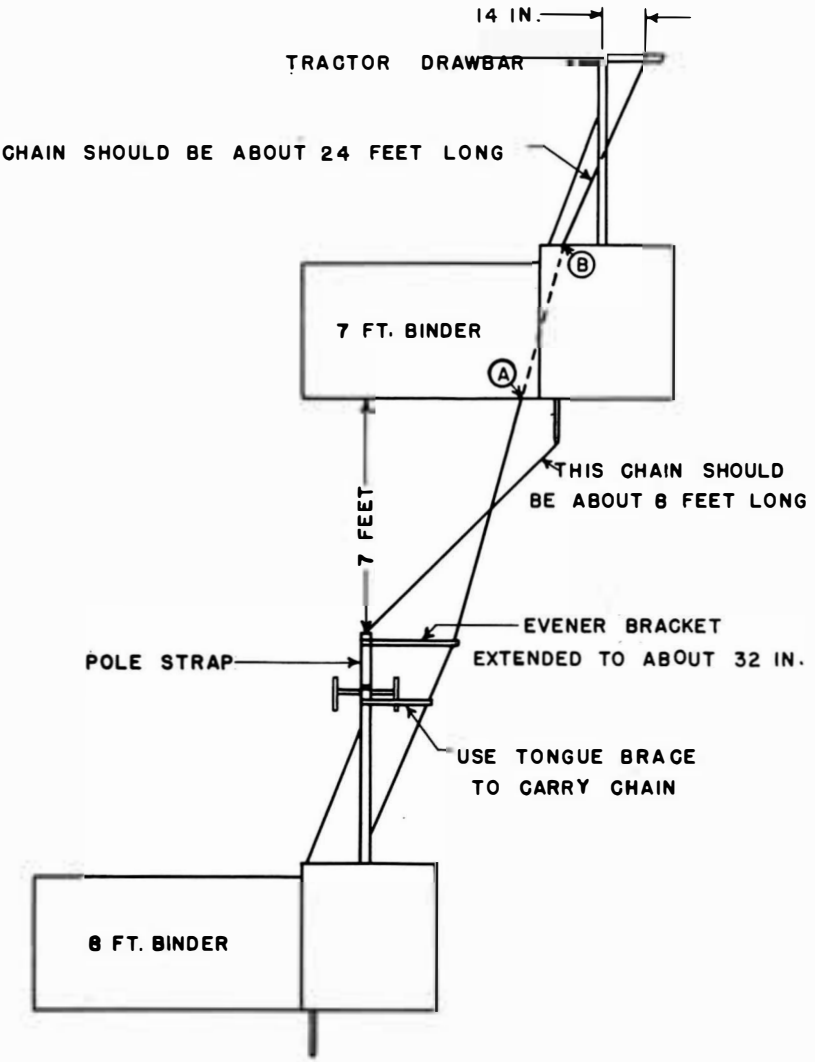

FIG. 1 BINDER AND HITCH ARRANGEMENT

Fig. 2. The two-binder hitch in use.

an ordinary clevise fastened to binder and holding the chain in place but still allowing it to slide.

6. Fasten one end of the long chain to the rear end of tongue on the second binder. This can be done with bolts or simply making a loop around the tongue. Then pass the chain or cable through the slip joints under the front binder and up to the tractor drawbar, hitching at a point approximately 14 inches to the right of where the binder tongue is fastened as in Fig. 1.

7. It is necessary to remove the evener bracket and lengthen it to about 32 inches or more. Then replace it in an inverted position making the end nearer the ground. Make the length of this bracket adjustable so that it can be

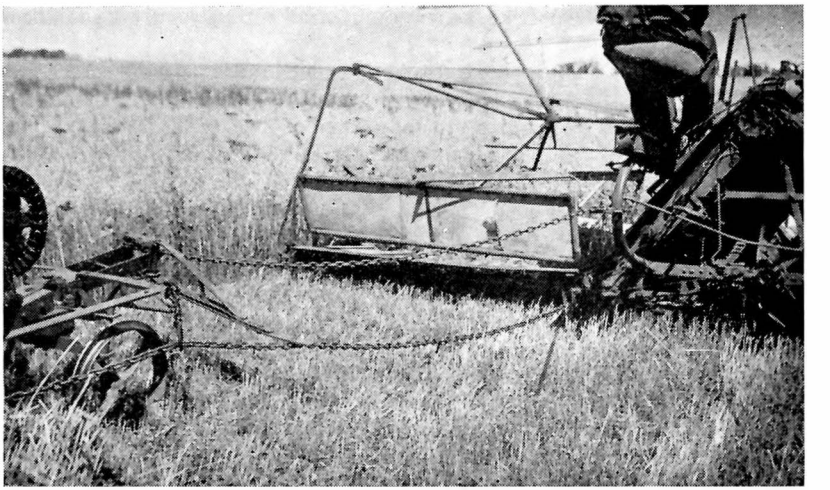

Fig. 3. This picture shows how the rear binder is hitched by means of chains. Arrow indicates the slip joint holding chain in place under the binder.

Fig. 4. Making a turn with the two-binder hitch. Notice the square corner.

changed if necessary. Then fasten the long chain securely to the end of the extended evener bracket as in Fig. 1. When this is done the long chain when tight should have a tendency to turn the tongue truck to the left or into the grain. This is necessary to make the rear binder trail correctly. Use the tongue brace to carry the weight of the chain, as illustrated in Figs. 1 and 3.

8. The short chain is used to counter-act the turning effect produced by the long chain. It should be at least 8 feet long and is fastened to the stub tongue of rear binder and to the seat pipe of the front binder as in Fig. 3. By shortening this chain the rear binder will tend to pull away from the grain, and by making it longer the rear binder will take a larger cut.

By making a few adjustments to fit the characteristics of various binders, it will be found possible to make the rear binder trail perfectly and take a full cut at all times.

When using this binder hitch it is not possible to turn a square corner. Referring to Fig. 4, a square corner can be seen, but when binders get into the grain and start cutting again, a pointed corner is left as the front binder does not enter the grain until it is about 6 feet past the corner. When the round is again completed, the corner will again be square as in Fig. 4, as the total cut takes off the pointed corner each time. Both binders cut clean at the corners and much better than if the front binder was pulled alone with this type of tractor.

Homemade Windrower

In many parts of South Dakota it is a common practice to cut small grain with a "swather" or "windrower" before using a combine. After the grain has become sufficiently dry for threshing, a combine with a pick-up attachment can be used. The added investment of a windrower has hindered many farmers from following this method of harvest.

Some farmers have used the conventional grain binder by removing the retarding springs, trip arm and bundle carrier. It is usually advisable to remove

Fig. 5. Binder deck with retarding springs and trip arm removed for windrowing.
1. Binder deck. 2. Butt adjuster. 3. Discharge arms in home position. 4. Grain cover. 5. Windboard.

the packers too. Then by locking the needle and discharge arms in home position, as in Fig. 5, the grain is free to slide off the deck and onto the stubble. This is a very convenient method, but has the disadvantage of letting the grain drop from the high deck to the stubble. The long drop permits the grain to mat into the stubble rather than to lay on top. In order to overcome this difficulty some have covered the binder deck with a large piece of sheet iron that was long enough to almost reach the ground. The lower end was curved upward to make a trough-like arrangement which would stop the rapid fall of the grain and permit it to slide out the back side onto the stubble. The lower end of this slide should be adjusted so that it will be nearly even with the top of the stubble. One manufacturer has just recently announced a windrow delivery trough which is attached below the binder deck, as in Fig. 6, which permits the cut grain to slide gently onto the stubble. All openings in the deck can be covered by means of sheet metal.

Other farmers have rebuilt old used binders into windrowers of larger cut. Such a machine is illustrated by Figs. 7 and 8 and have been constructed in South Dakota. The platform has been extended about 2 feet beyond the main binder frame and a 2 foot extension welded to the cutter bar, making possible a larger cut. An arch was constructed on the rear frame to allow passage for the windrow. It is also necessary to lengthen the reel and sickle a like amount. The entire binder head and elevators were removed.

These machines do very good work and their operation is entirely satisfactory if a combine is used that has the pick-up attachment operating on the left hand side similar to a binder. However, many combines have the cutting attachment on the right side of the machine making it impossible when starting at the outside of the field, to pick up the grain, heads first. In other words, the combine must travel in the opposite direction from that of the windrow machine. One alternative is to start at the center of the field and go counter-clockwise (same as windrower) but this causes much driving over windrows, which is undesirable. Another method, practiced by some, is to divide the field into lands of convenient size and using a mower to open up the center of each land. Then begin with the windrower working out from the center, similar to plowing around a back furrow. Then when using a right handed combine with a pick-up attachment, begin at the outside of the land and work towards the center. When using this method, no cutting or threshing can be done at the ends of the land.

It was for this reason that the South Dakota Agricultural Experiment Station decided to investigate the possibilities of rebuilding an old binder into a right hand windrower to better suit the needs of the right hand combine.

An old used binder was secured for this purpose and the platform was entirely removed from the left hand side and placed on the opposite side of bull wheel. The grain wheel was removed and the grain wheel end of the platform was placed nearest the bull wheel. A 6 foot extension was welded to the cutter bar and guards mounted as illustrated by Fig. 9. This extension was made long so the cutter bar could be fastened to the main binder frame in the original manner. By using this construction the same pitman could be used just as before. It was, of course, necessary to make the sickle and reel much longer and reverse the sickle head.

The reel drive can be seen in Fig. 10. This drive can be either attached to the bull wheel chain tightener or have a separate sprocket drive from the bull

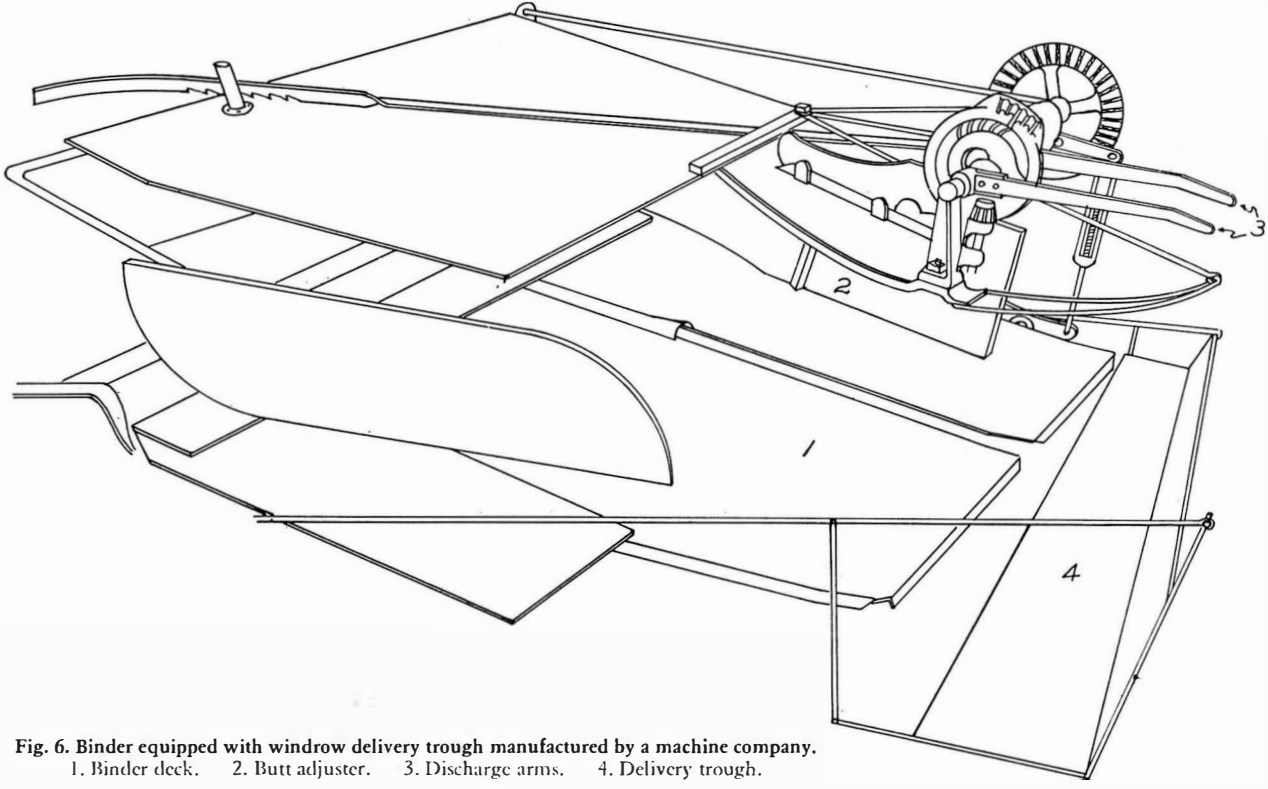

Fig. 6. Binder equipped with windrow delivery trough manufactured by a machine company.
1. Binder deck. 2. Butt adjuster. 3. Discharge arms. 4. Delivery trough.

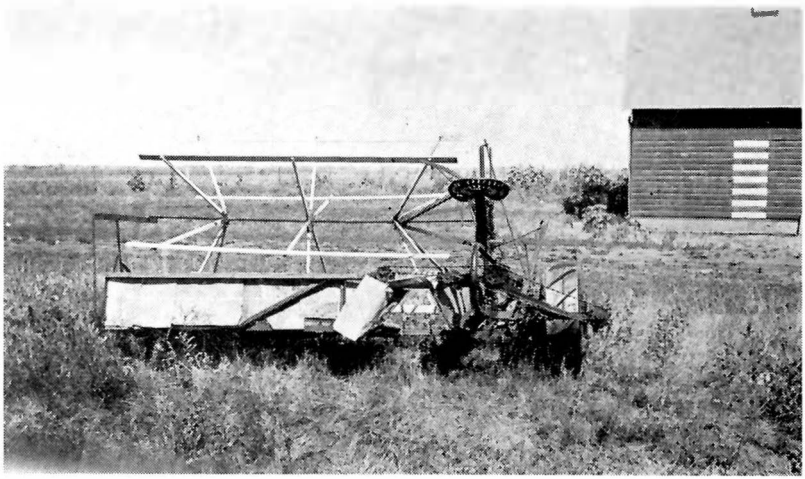

Fig. 7. Rear view of a homemade windrower.

wheel chain and thereby drive the reel through a suitable chain and sprocket arrangement.

The platform canvas is driven from a sprocket mounted as usual on the end of the crankshaft. Since the platform was placed on the opposite side from that of the original binder it was necessary to reverse the direction of the drive. This was accomplished by using two sprockets connected by gears as illustrated by Fig. 11. It also shows the manner in which the rear part of the platform was attached to the main binder frame.

The welded framework was constructed of 1½ x 1½ x ¼ inch angle iron. The total cost for labor, materials and welding amounted to about $30. The disadvantage of this arrangement is the difficulty of construction.

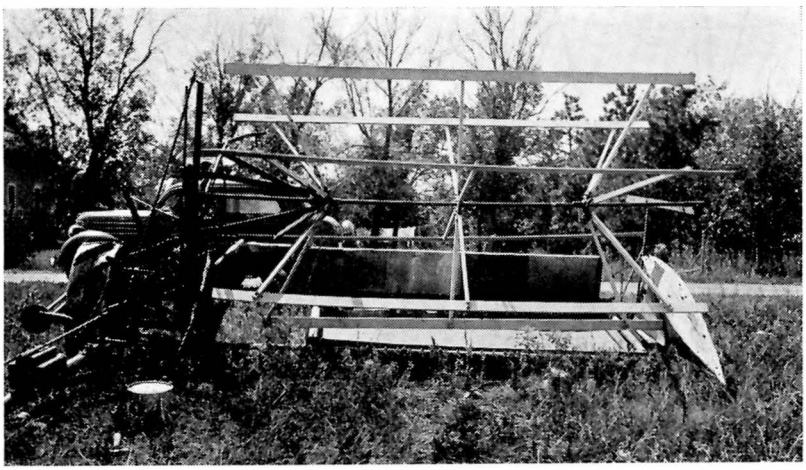

Fig. 8. Front view of windrower showing extension of cutter bar and reel.

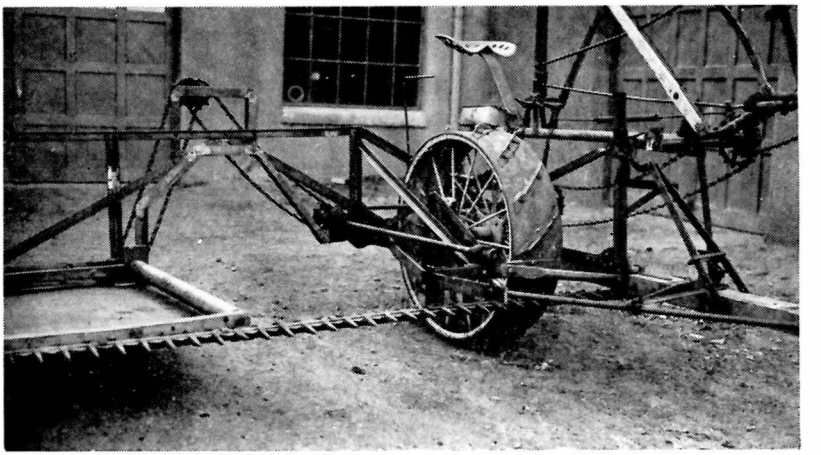

Fig. 9. This picture shows the cutter bar construction. The guards located beneath the pitman serve only as bearing surface for sickle.

Any farmer who has an old header available will find that it makes a very good windrower for a right hand combine by merely removing the elevator.

Regardless of the type of windrower used, it is important that the swath be deposited in a loose, fluffy windrow on top of the stubble, between tractor wheel tracks where the stubble has not been bent down.

A properly laid windrow on top of the stubble has a free air space below which permits air circulation and better drying. The pick-up attachment does not have to constantly scrape and dig into the ground in an effort to get grain lying flat on the ground or in wheel tracks.

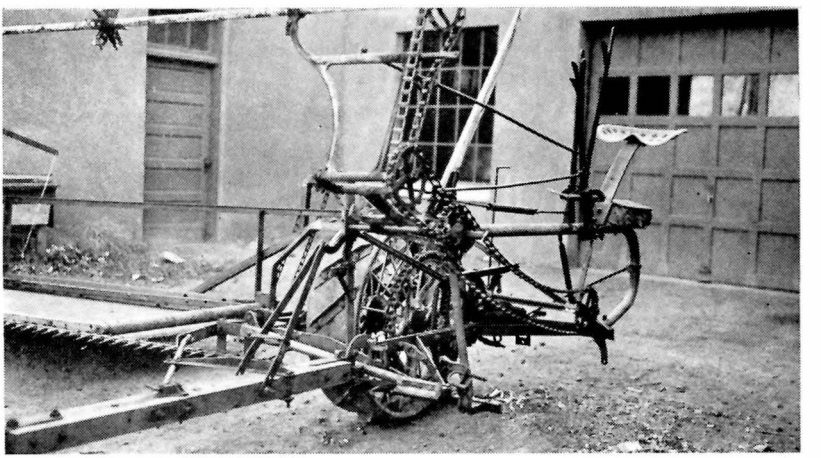

Fig. 10. This shows the reel drive arrangement.

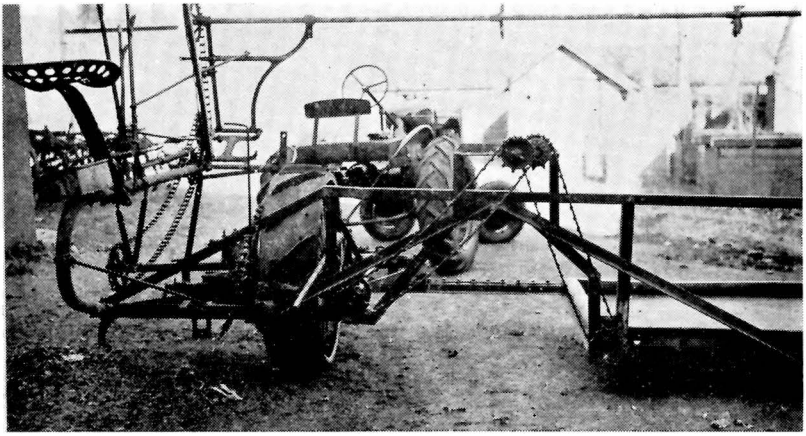

Fig. 11. This picture shows the arch construction on rear part of frame and the platform canvas drive

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