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# Improved Forage Box

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STATE COLLEGE

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# IMPROVED FORAGE BOX

By T. N. JONES, AGRICULTURAL ENGINEER

Better methods and equipment are necessary for continued economical improvement of the livestock program in Mississippi.

Equipment for moving forage from the field to green feeding or storage is available from many sources today. One thing the user must determine is shall the equipment be used for silage handling only, or shall it be used in more than one type of forage production.

The forage box presented here includes refinements and improvements made by the Agricultural Engineering Department of the Mississippi Agricultural Experiment Station. It can be built at home if facilities are available or in a shop equipped for this type of construction. This plan is designed to produce a forage box capable of lasting a minimum of ten years, therefore the initial cost is higher than some designs but the maintenance is low, thus the overall cost is very reasonable.

The box may be used on several types of vehicles, such as the four-wheel trailer or trucks. If the four-wheel trailer is used it should be of a heavy type as the box has a capacity of five to six tons of green forage. Normally the forage is unloaded by a gear reduction box<sup>1</sup> driven with one-third H.P. electric motor. If mounted on a truck the forage may be unloaded with power from the truck power take-off.

## The Bed

This bed which is 7'8" wide and 14'

<sup>1</sup>Gear reduction boxes are available from Claffey Machine and Manufacturing Company, Grovesport, Ohio.

long is strong enough to carry a normal size tractor, yet flexible enough to fit most jobs on the livestock farm. The bed is welded and therefore stiff. It should be fastened to the trailer at two places only, one on front bolster and the other on rear bolster on opposite side from the front. It is not recommended to put this type bed on a trailer which has springs.

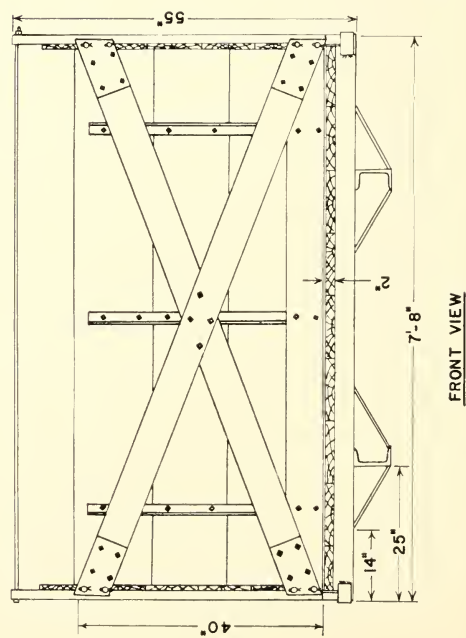
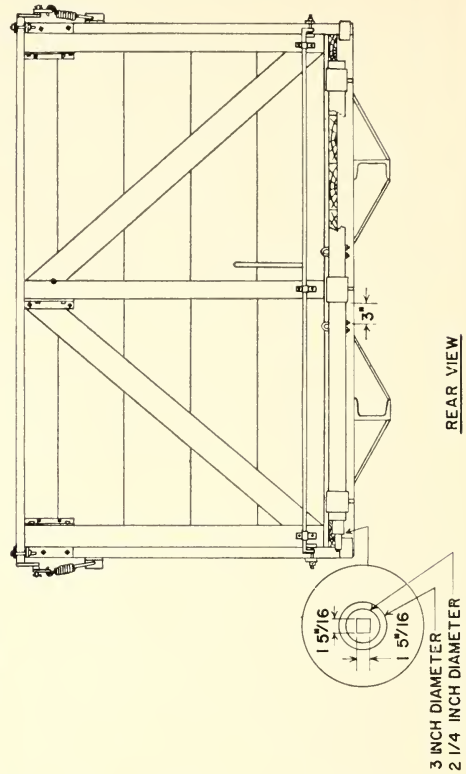
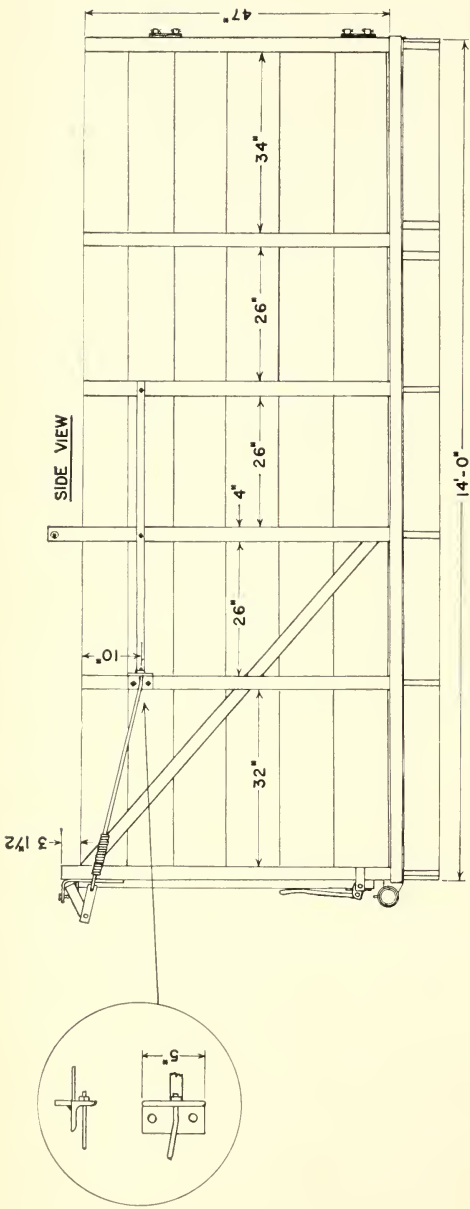
It is necessary that the trailer be coupled to proper length and that the cross pieces of channel iron be placed so that the wheels of the trailer will be free at all times. The two-inch floor should be bolted to the three-inch channel cross pieces, with a 3/16" X 3" strap on top of the wood around the edge. This metal strap will protect the edge of the wood permitting longer life for the bed.

## Sides of Box

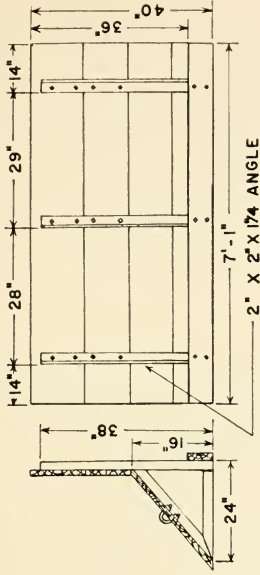
The sides of the forage box are 4' X 14' with standards which fit between metal straps on the bed. The plan shows one standard 55" high with a 1/2" rod through the standards, and a pipe over the rod on the inside of the standards. This prevents the sides from moving in when empty and out when full. Some types of harvesters have larger fans than others; it may be desirable to have the back four standards 55" high and use one-inch hardware cloth around the top to prevent the forage being blown over top of bed.

## End Gates

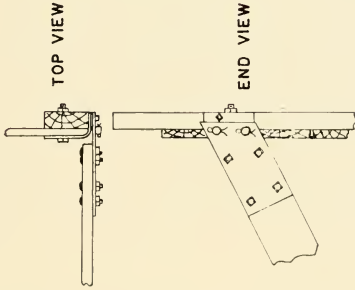
**Front:** The front end gate is constructed to slide on the floor of the forage box bed and pull the forage out of the trailer. This is done by cables fastened to the end gate and the pipe mounted on



FALSE END GATE



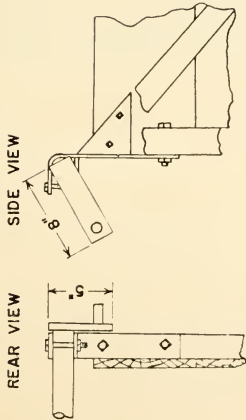
FRONT GATE



TOP VIEW

END VIEW

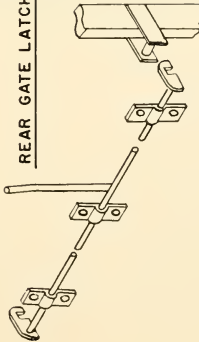
REAR HINGE



REAR VIEW

SIDE VIEW

REAR GATE LATCH



3/16 X 3" STRAP

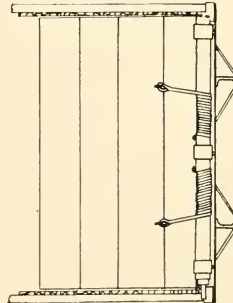
3" STRAP

3" CHANNEL

2 1/2" STRAP

5/16 X 1 1/2" STRAP

6" CHANNEL



CABLES ATTACHED TO FALSE END GATE

MISSISSIPPI AGRICULTURAL EXPERIMENT STATION AGRICULTURAL ENGINEERING DEPARTMENT	
DR. BY: W. McCORD	APP. BY:
CH. BY: T. N. JONES	DATE: MARCH 1962
<b>SILAGE BOX</b>	



the rear of the trailer. As the reduction gear box pulls the false front-end gate to the rear the forage is pulled out the rear of the trailer. The front-end gate may be moved back to the front of the trailer by hand after the trailer is empty and the reduction gear box removed. It is advisable to have a catch on the front end gate otherwise it will slide while in transport when empty.

**Rear:** The rear end gate is swung at the top of the trailer and counter balanced with springs so that it will stay in a horizontal position while unloading. Therefore, to open or close a given amount of pull is required. This is a very desirable feature both from safety and time saved. The latch on bottom of gate is home made and functional. If the gate is latched and ring placed over the handle it cannot come loose.



## BILL OF MATERIALS

<u>Metal</u>				
Bed	Weight	Length	Total Needed	
2 pc.	6" channel	standard	14'	28'
6 pc.	3" channel	standard		
2 pc.	3/16" x 3" strap		14'	28'
2 pc.	3/16" x 2 1/2" strap		14'10"	29'8"
30 pc.	3/16" x 2 1/2" x 2" strap		2"	5'
18 pc.	5/16" x 1 1/2" x strap			12"
2 pc.	1/8" x 3" x 88"			
2-4"	U-bolts 3/8" x 1 1/2" to hold cables			4
2-5/16"	cable clamps			
2 pc.	5/16" cable		13'	26'
1 pc.	3" O.D. double strength pipe		7'	7'
1 pc.	2 1/2" shaft with end machined to 1-5/16" square for gear reduction fitting			12"
3 pc.	3" I.D. pipe X 4"			12"
2	straps for rear door tractor mower springs		5/16" x 20"	
2 pc.	strap 1/8" x 1 1/2" x 60"		60"	10'
<b>Bed</b>				
2 pc.	rod 1/2" x 28"		28"	5"
2 pc.	strap 1/2" x 2" x 5"			
2 pc.	strap 3/8" x 1 1/2" x 15"			
2 pc.	strap 1/4" x 1 1/2" x 7 1/4"			
2 pc.	strap 1/2" x 2" x 7"			
2 pc.	U 3/8" x 1 1/2" x 3"			
3 pc.	angle 1 1/2" x 9"			
1 pc.	pipe 3/4" I.D.		89 1/4"	89 1/4"
3 pc.	strap clamp for 3/4" pipe 1/8" x 1 1/2" x 3 1/2"			12"
1 pc.	pipe 3/4" I.D.		12"	12"
<b>False end gate</b>				
3 pc.	angle 2" x 2" x 1/4"		22 1/2"	72"
3 pc.	angle 2" x 2" x 1/4"		24"	72"
3 pc.	angle 2" x 2" x 1/4"		40"	120"
<b>Front gate</b>				
4 pc.	strap or plates 6" wide x 8" on one side by 10" on other side x 1/2"			
4 pc.	angle 4" x 4" x 1/2" x 1 3/4" bolts			
	hole for cotton key, welded to angle to hold X front gate on			
<b>Bolts</b>				
As needed				
<b>Wood</b>				
<b>Cresoted</b>		<b>Popular or other suitable material (rough)</b>		
8 pc	2" x 8" x 14"	6 pc	1" x 8" x 14"	
1 pc	2" x 12" x 14"	1 pc	2" x 6" x 85"	
<b>Oak</b>		2 pc.	1" x 5" x 91 1/2"	
2 pc	1 3/4" x 3" x 58"	6 pc	1" x 12" x 85"	
10 pc	1 3/4" x 3" x 52 1/2"	8 ps	1" x 12" x 88"	
2 pc	1 3/4" x 3" x 40"	1 pc.	1" x 6" x 88"	
2 pc	1 3/4" x 3" x 33"	2 pc	1" x 6" x 60"	
		1 pc	1" x 4" x 55"	