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Wagon Rack for Self Feeding Dairy Cattle

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O. I. Berge, F. W. Duffee, M. F. Finner Agricultural Engineering, University of Wisconsin, Madison

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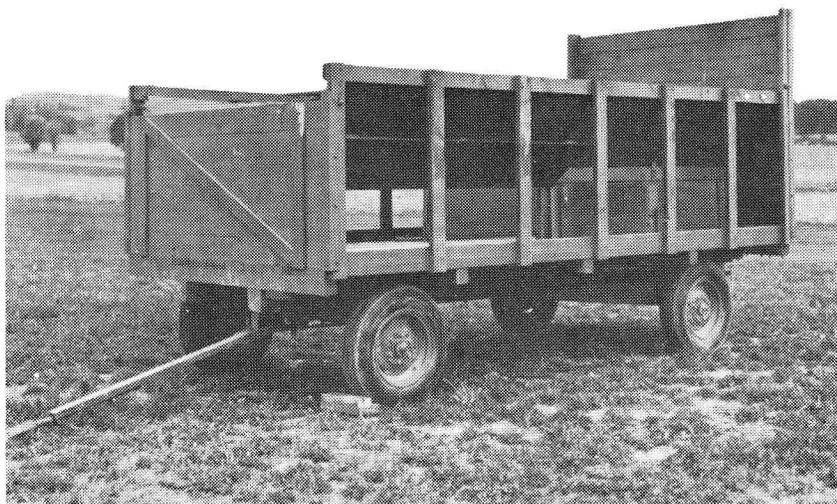
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Wagon Rack for Self Feeding Dairy Cattle

O. I. Berge¹
F. W. Duffee²
M. F. Finner³



THIS WAGON RACK is a design resulting from close observation for one season of a herd of cattle where green forage was cut and fed twice daily. This rack reduces waste to a satisfactory minimum. It is completely self-feeding, substantial and relatively easy to build.

Rack Length

The length of the rack depends on the number of cattle to be fed. A feed opening for every 2 1/2 head is best and there should not be more than 3 head per opening. Here's the length needed for different size herds.

<u>No. of Cows</u>	<u>Rack Length</u>
30 - 36	14 feet
35 - 42	16
40 - 48	18
45 - 54	20

Rack Width

The size of the animals determines the width. Cows should be able to reach the center of the rack. Here's the recommended floor width (dimension A in Fig. 1) for three sizes.

<u>Cow Sizes</u>	<u>Rack Width</u>
Large Cows	6 ft. 8 in.
Medium Cows	6 ft. 2 in.
Small Cows	5 ft. 8 in.

¹Department of Agricultural Engineering, University of Wisconsin, Madison.

²Head of Department of Agricultural Engineering, University of Wisconsin, Madison.

³Department of Agricultural Engineering, University of Wisconsin, Madison.

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GENERAL CONSTRUCTION

The wagon should be ruggedly constructed to hold up under high speed pulling and heavy loads. Therefore, all principal connections and joints are bolted and machine bolts used wherever possible. Put washers under the heads and nuts of all machine bolts and under the nuts of carriage bolts where they are against wood.

Endgates and door boards should be nailed to the cleats with nails long enough to clinch.

Floor

A floor made of planks will last much longer than a board floor. The planks should be spaced slightly to allow for swelling.

Preservative Treatment

It is highly recommended that all wood pieces be treated before assembly with a solution of pentachlorophenol. This will reduce rotting and the surface can be painted. Avoid paints containing lead -- they are poisonous to cattle.

Rack Plan

The plan calls for a rack 14 ft. long and 6 ft. 8 in. wide, which is suitable for 30 to 36 large cows. If different dimensions are desired, several parts will have to be changed.

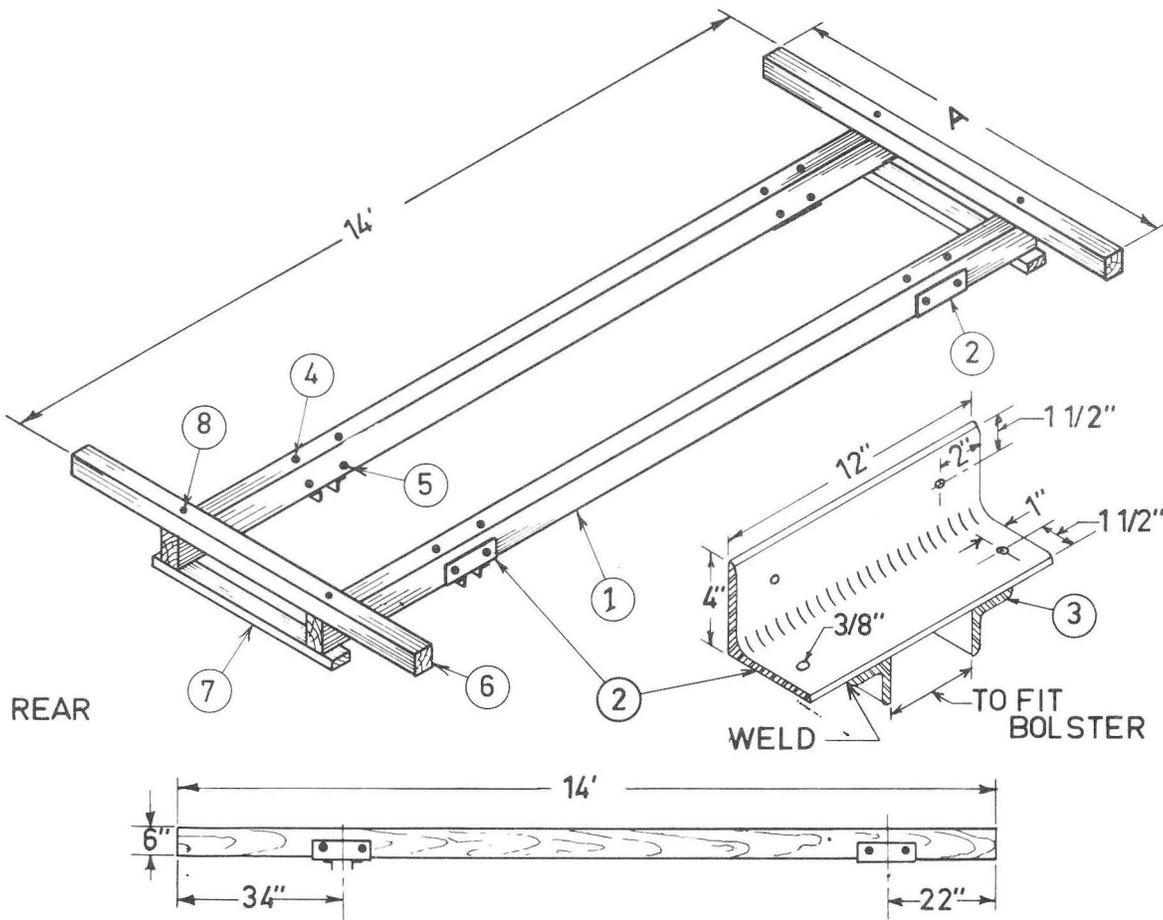
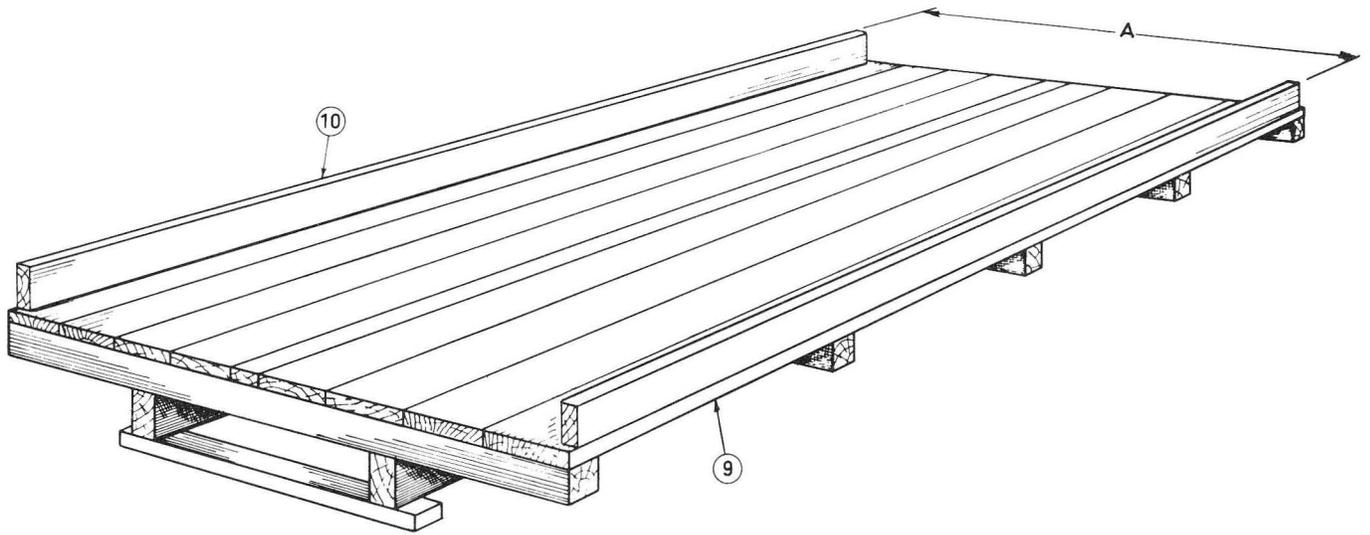


Fig. 1. FRAME Bolt bolster irons (2) to sills (1). An enlarged view of the rear bolster iron is shown. Use washers where the nuts or heads of the bolts are against wood. The left-hand end is the rear end. Space sills (1) to fit wagon bolsters. The sills should be level. Place cross sills (6) and see whether parts (6) fit flat on the sills. If the parts (6) do not fit flat due to warping of the sills, cut the high edges off the sills until the parts (6) do fit

flat. Dress down the bottom edges of the sills, if necessary, so that parts (7) also fit flat against the sills. This is important to insure a platform free from warp. Drill holes and insert bolts (8). Square the frame by measuring the diagonals which should be equal. Bolt one plank ((9) in Fig. 2) to end cross sills at each side. Position the balance of the cross sills equally spaced and bolt to main sills with bolts (8).



REAR

Fig. 2. PLATFORM FRAME Nail the balance of the floor planks in place using 20d common nails. Work from each side toward the center, ripping the last plank to fit. If the planks are thoroughly dried, space them slightly, using a 6d common nail as a

spacer. Cut two 2 x 4's 2 in. shorter than the floor planks. These will be the feeding ledge. Bolt the feeding ledge (10) on edge of the outside planks using bolts (11) and locating it so the ends are 1 in. from the rack ends.

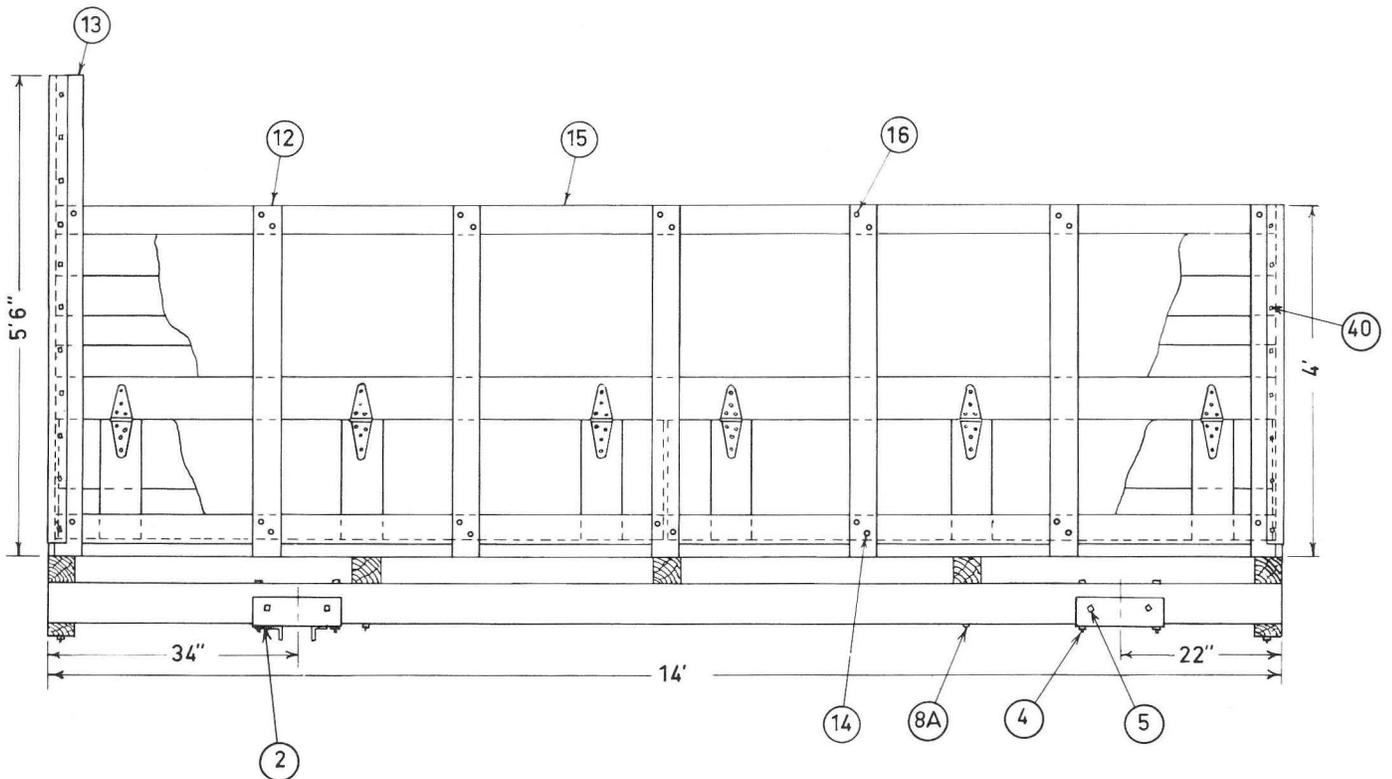


FIG. 3. Bolt stakes (12) and (13) to the feeding ledge at front and rear respectively. Note the side of stake is flush with the end of the feeding ledge which is 1 in. from the rack end. This allows room for the end gate boards to rest on the floor.

Square up the end stakes with temporary bracing and bolt top rail (15) in position. Mark off the spacing for feeding partitions and bolt in place those stakes where a bracket does not attach to the rail. (Figs. 5 or 8 show bracket spacing.)

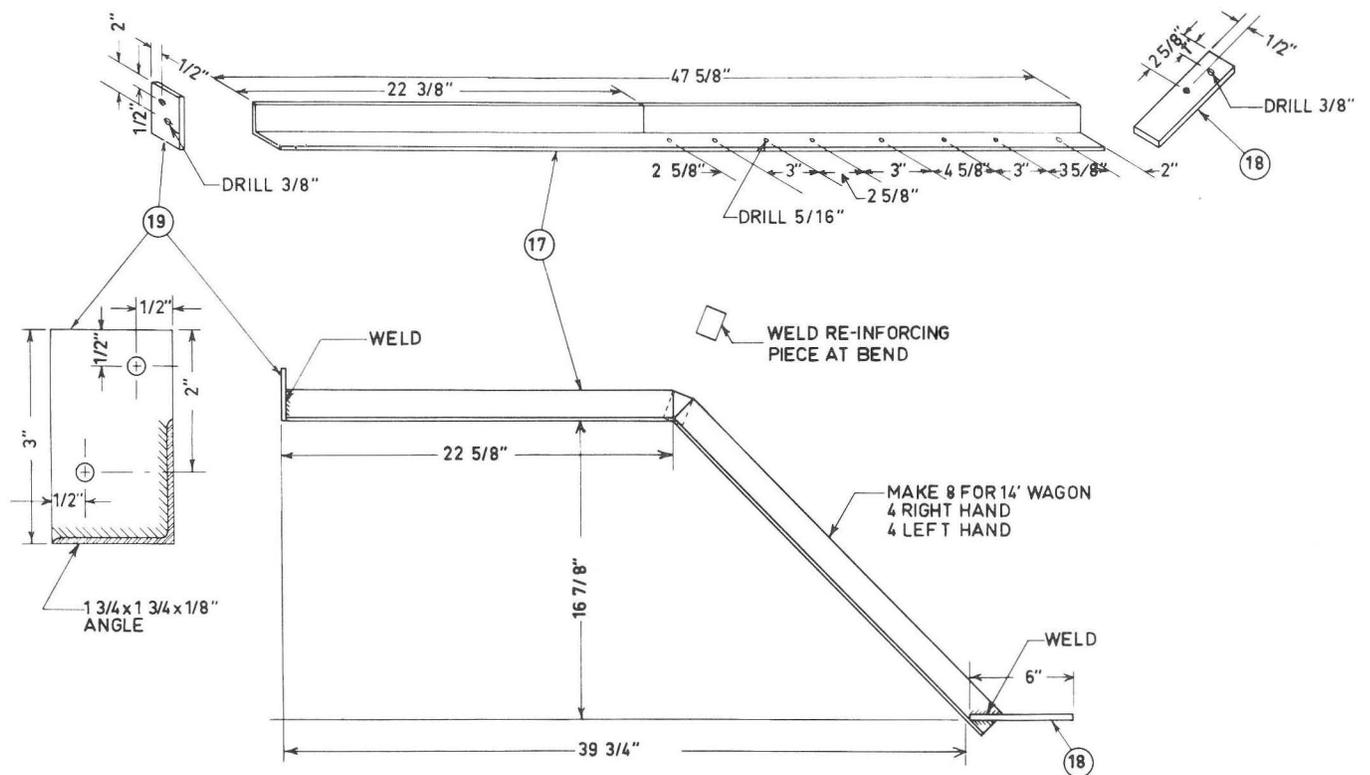


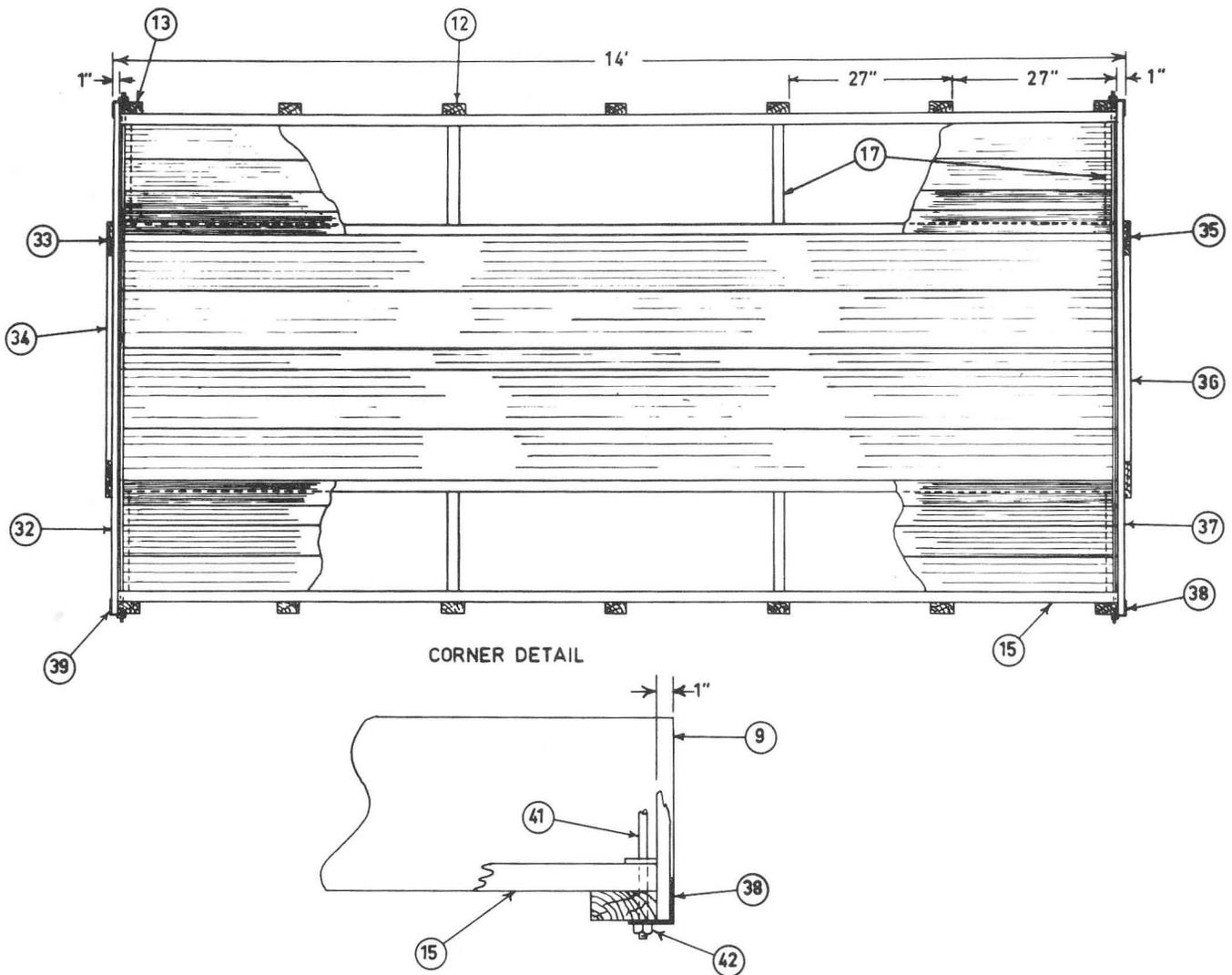
FIG. 4. Make up the angle brackets (17) Fig. 4. A 1 3/4 by 1 3/4 by 1/8 angle is preferred, but a 1 1/2 by 1 1/2 by 3/16 angle is acceptable. Make up the number required for the wagon length, Half of the brackets should be made up as right hand and half as left hand to help bolting the endgates to the end brackets.

To make up right and left hand brackets: Lay two of the angle iron pieces (17) side by side on a flat surface with one leg of each flat and these legs

edge to edge. Put the holes in each piece in the leg that is flat on the surface and make the saw cut in each piece in the leg that is vertical. This will make one right hand and one left hand when bent according to the diagram in Fig. 7.

To get the proper angle: Lay out two parallel lines 16 7/8 in. apart on a smooth floor. Draw a line square across these lines at one end. Mark a point on one line 39 3/4 in. from where these lines cross. Bend the angles at the saw cut as shown in Fig. 7.

FIG. 5. Square the feeding partitions (12) before bolting the brackets in position. Bolt the balance of the partitions (12) in place.



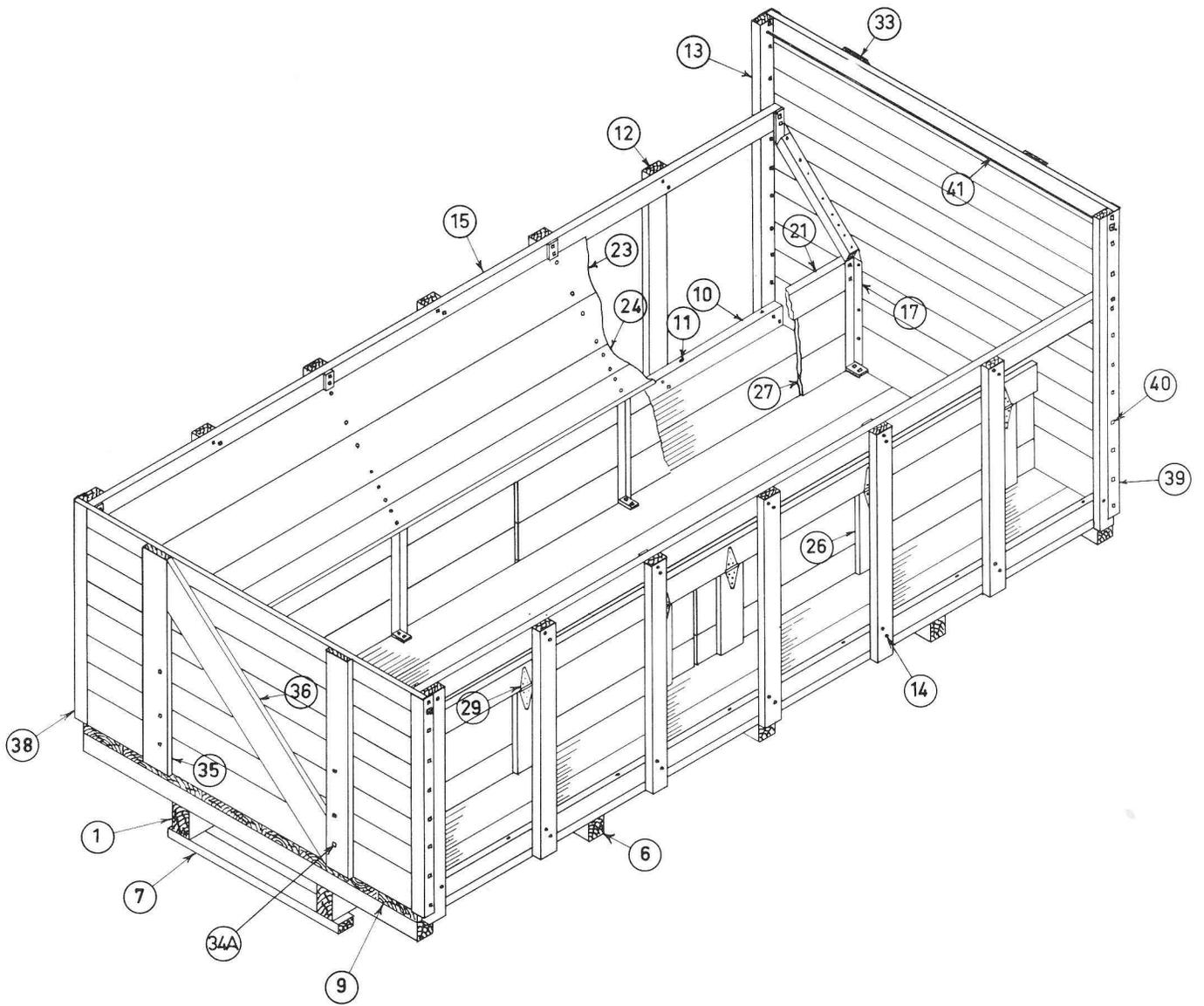


FIG. 6. Make up the front and rear endgates. Nail temporarily into position. Cut the angle iron pieces (38 and 39). Bolt them to the corner 2 by 4 uprights with bolts (40). Make up the tie rods (41) and install them at front and rear, 2 in. from the top of the stakes.

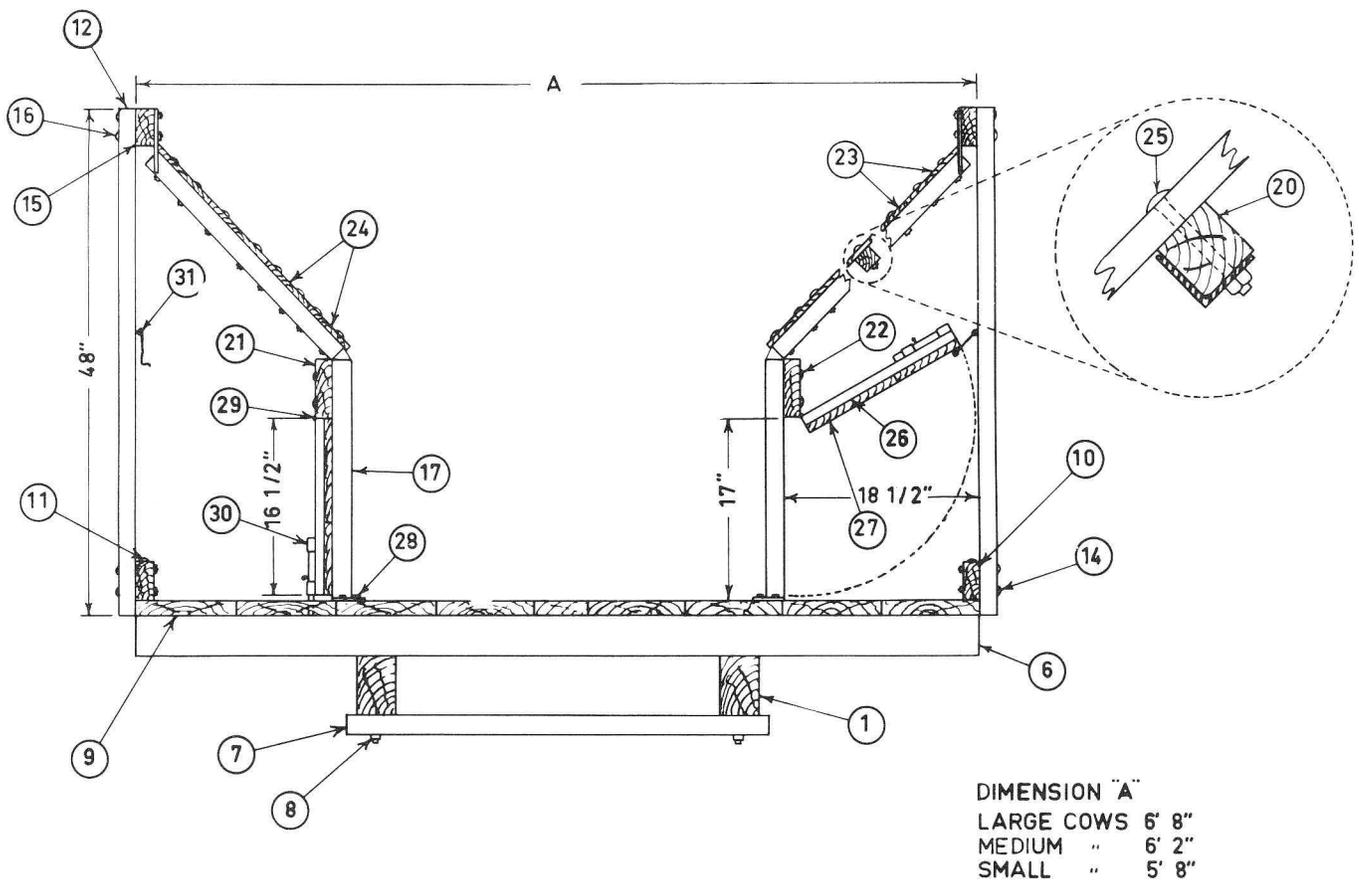


Fig. 7. FLARING SIDES ON ANGLE BRACKETS Cut boards to length and bolt to the angle brackets using a 2 by 2 filler piece (20) at each bracket.

Saw to length and bolt the (2 by 6) hinge board (21) to the angle brackets.

Make up the doors allowing 1/2 in. clearance

at bottom. Use 3 cleats and 3 hinges per door. Attach end cleats 6 in. from door ends with 8d nails and clinch. Hang doors and attach hooks and eyes (31) to hold them open and latch bolt (30) to hold them shut. Drill hole for latch bolt clear through floor so fodder or refuse will not clog the hole.

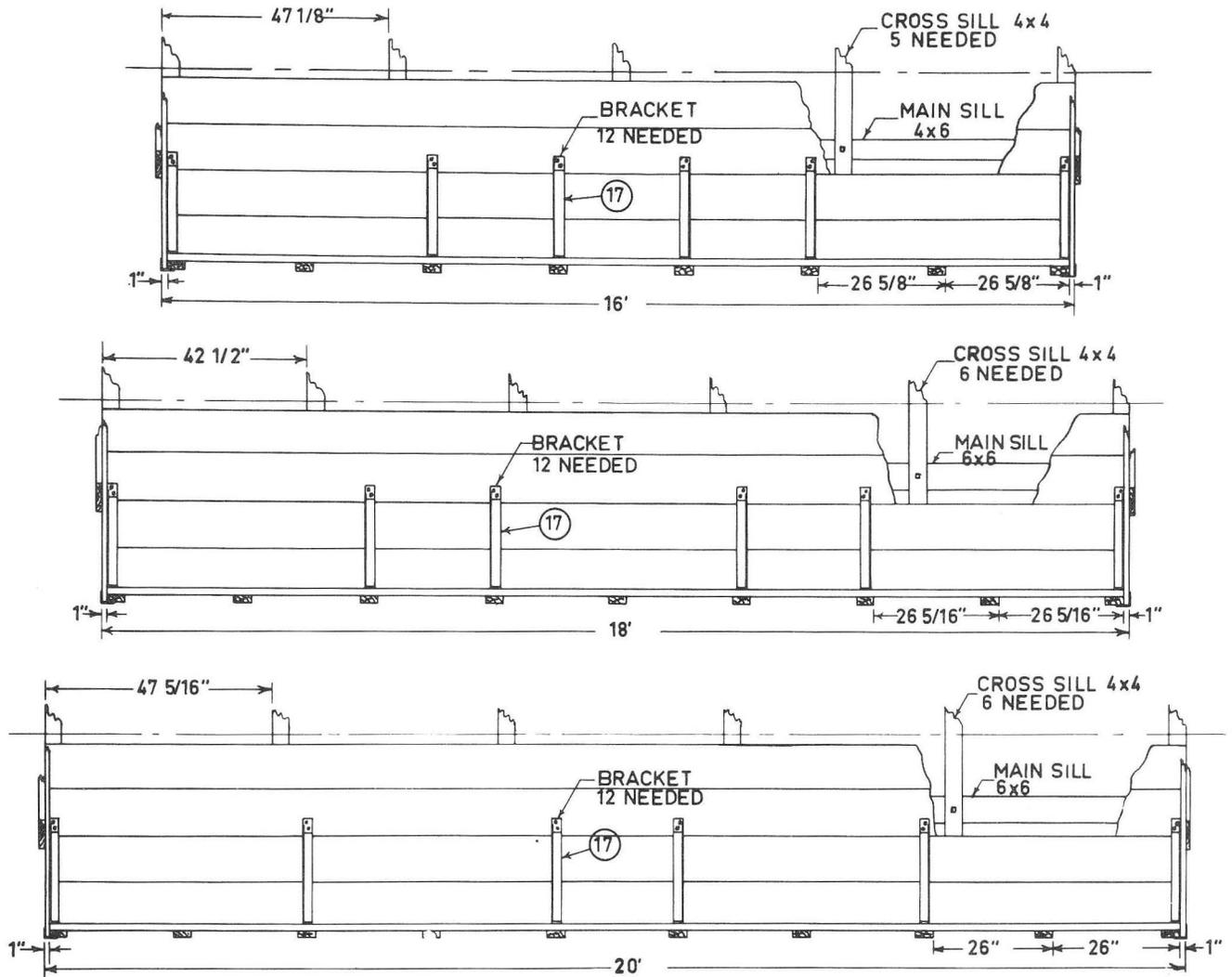


FIG. 8. Figure 8 shows half-floor plans of 16, 18 and 20 foot wagon racks. Each plan shows length and size of mainsill, number and spacing of cross sills, also number and spacing of brackets and feeding partitions.

Bill of Materials

Material specifications have been drawn up for wagons of 14, 16, 18 and 20 foot lengths and for 3 widths of each of these lengths. Be sure to order materials for the length and width of rack being built.

Parts for All of the Wagons

Bolt lengths are based on commercial lumber.

Part No.	Description	Dimension	No. Needed
2	Bolster Iron	4" x 4" x 1/4" x 12" Angle	4
3	Bolster Iron Parts	2" x 2" x 3/8" x 4" Angle	4
4	Bolts for Bolster Irons	3/8" x 6 1/2" Machine	8
7	Cross Tie	2" x 4" x 40"	2
8	Bolts for End Cross Sills	1/2" x 12" Machine	4
13	Rear Stakes	2" x 4" x 5 1/2'	2
26	Door Cleats	1" x 6" x 16"	12
28	Lag Screws for Bracket Foot (End Brackets Only)	3/8" x 3"	8
29	Hinges	5" Strap Type	6 pr.
		1/4" x 2" F. H. Stove Bolts	96
30	Sliding Latch	Heavy Duty Type	4
31	Hooks and Eyes	5" Hooks	4
32	Rear End-Gate Boards	1" x 8" x 7' *	1
	Rear End-Gate Boards	1" x 6" x 7' *	10
33	Rear End-Gate Cleats	1" x 6" x 5 1/2'	2
34	Rear End-Gate Brace	1" x 6" x 6' Approx.	1
34A	Bolts Through End-Gate and Bracket	3/8" x 2 1/2" Machine	12
35	Front End-Gate Cleats	1" x 6" x 46"	2
36	Front End-Gate Brace	1" x 6" x 56" Approx.	1
37	Front End-Gate Board	1" x 8" x 7' *	1
	Front End-Gate Boards	1" x 6" x 7' *	7
38	Front Corner Irons	2 1/2" x 2 1/2" x 1/8" x 46" Angle	2
39	Rear Corner Irons	2 1/2" x 2 1/2" x 1/8" x 64" Angle	2
40	Bolts for Corner Irons	5/16" x 2 1/2" Machine	30
41	Tie Rods	1/2" x 7' *	2
42	Tie Rod Nuts	1/2"	4

Part No.	Description	Dimension	No. Needed
16	Bolts for Stakes (upper)	3/8" x 4" Machine	28
17	Angle Iron Bracket	1 3/4" x 1 3/4" x 1/8" x 47 5/8" Anglè	8
18	Bracket Part	1 3/4" x 1/4" x 6"	8
19	Bracket Part	1 3/4" x 1/4" x 3"	8
20	Bracket Spacer	2" x 2" x 24"	8
21	Hinge Board	2" x 6" x 13' 10"	2
22	Bolts for Hinge Board	3/8" x 2 1/2" Machine	16
23	Boards for Flared Sides	1" x 8" x 13' 10"	4
24	Boards for Flared Sides	1" x 6" x 13' 10"	4
25	Bolts for Above	5/16" x 3" Machine	64
27	Door Boards	1" x 10" x 6' 11"	4
	Door Boards	1" x 8" x 6' 11"	4
28	Bolts for Brackets	3/8" x 2 1/2" Machine	8

Bolts and Hardware

No. Pieces	Size and Description ****	No. Pieces	Size and Description ****
8	3/8" x 6 1/2" Machine	6 pr.	5" Strap Hinges
8	3/8" x 4 1/2" Machine	4	5" Hooks and Eyes
4	1/2" x 12" Machine	4	Sliding Bolt Latch (heavy duty)
6	1/2" x 10" Machine	3 lbs.	20d Common Nails
14	3/8" x 6" Machine	3 lbs.	3/8" Washers
56	3/8" x 4" Machine	1 lb.	1/2" Washers
36	3/8" x 2 1/2" Machine	1 lb.	1/4" Washers
64	5/16" x 3" Machine	1 lb.	5/16" Washers
30	5/16" x 2 1/2" Machine	5 lbs.	8d Clinch Nails
8	3/8" x 3" Lag Screws		
96	1/4" x 2" Flathead Stove Bolts		

Summarized Material Order

No. Pieces	Description	No. Pieces	Description
2	4" x 6" -- 14' Douglas Fir or Oak	1	1" x 6" -- 12' Pine
5	4" x 4" -- 7' * Douglas Fir or Oak	4	1" x 6" -- 8' Pine
2	2" x 6" -- 14' W. Pine or Hemlock	4	4" x 4" x 1/4" -- 12" Angle Iron
9	2" x 10" -- 14' ** W. Pine or Hemlock	4	2" x 2" x 3/8" -- 4" Angle Iron
4	2" x 4" -- 14' W. Pine or Hemlock	8	1 3/4" x 1 3/4" x 1/8" x 47 5/8" Angle Iron
5	2" x 4" -- 12' W. Pine or Hemlock	8	1 3/4" x 1/4" x 3" Flat Bar Steel
1	2" x 4" -- 8' Pine or Hemlock	8	1 3/4" x 1/4" x 6" Flat Bar Steel
2	2" x 2" -- 8' Pine or Hemlock	2	2 1/2" x 2 1/2" x 1/8" x 46" Angle Iron
2	1" x 10" -- 14' Pine	2	2 1/2" x 2 1/2" x 1/8" x 64" Angle Iron
7	1" x 8" -- 14' Pine	2	1/2" x 7' Rods
4	1" x 6" -- 14' Pine	4	1/2" Nuts
9	1" x 6" - 14' **** Pine		

**** Bolt lengths here are based on nominal thickness and width of commercial lumber. For home-sawed lumber increase as needed.

The 14 Foot Wagon Rack

Parts

Part No.	Description	Dimension	No. Needed
1	Main Sill	4" x 6" x 14'	2
5	Bolts for Bolster Irons	3/8" x 4 1/2" Machine	8
6	Cross Sills	4" x 4" x 6' 8" *	5
8A	Bolts for Sills	1/2" x 10" Machine	6
9	Floor Planks	2" x 10" x 14'	9**
10	Manger Ledge	2" x 4" x 13' 10"	2
11	Bolts for Manger Ledge	3/8" x 6" Machine	14
12	Side Stakes	2" x 4" x 4'	12
14	Bolts for Stakes (lower)	3/8" x 4" Machine	28
15	Upper Rail	2" x 4" x 13' 10"	2

* For small cows (narrow rack) this part can be ordered 6' long and cut to fit.

** Only 8 planks are needed for 6' 2" and 5' 8" rack widths.

*** For small cows (5' 8" rack width), 12' length boards can be ordered.

The 16 Foot Wagon Rack

Parts

Part No.	Description	Dimension	No. Needed
1	Main Sill	4" x 6" x 16'	2
5	Bolts for Bolster Irons	3/8" x 4 1/2" Machine	8
6	Cross Sills	4" x 4" x 6' 8" *	5
8A	Bolts for Cross Sills	1/2" x 10"	6
9	Floor Planks	2" x 10" x 16'	9 **
10	Manger Ledge	2" x 4" x 15' 10"	2
11	Bolts for Manger Ledge	3/8" x 6" Machine	16
12	Side Stakes	2" x 4" x 4'	14
14	Bolts for Stakes (lower)	3/8" x 4" Machine	32
15	Upper Rail	2" x 4" x 15' 10"	2
16	Bolts for Stakes (upper)	3/8" x 4" Machine	32
17	Angle Iron Brackets	1 3/4" x 1 3/4" x 1/8" x 47 5/8" Angle	12
18	Bracket Part	1 3/4" x 1/4" x 6"	12
19	Bracket Part	1 3/4" x 1/4" x 3"	12
20	Bracket Spacer	2" x 2" x 24"	12
21	Hinge Board	2" x 6" x 15' 10"	2
22	Bolts for Hinge Board	3/8" x 2 1/2" Machine	24
23	Boards for Flared Sides	1" x 8" x 15' 10"	4
24	Boards for Flared Sides	1" x 6" x 15' 10"	4
25	Bolts for Above	5/16" x 3" Machine	96
27	Door Boards	1" x 10" x 7' 11"	4
	Door Boards	1" x 8" x 7' 11"	4
28	Bolts for Brackets	3/8" x 2 1/2" Machine	16

The 18 Foot Wagon Rack

Parts

Part No.	Description	Dimension	No. Needed
1	Main Sill	6" x 6" x 18'	2
5	Bolts for Bolster Irons	3/8" x 6 1/2" Machine	8
6	Cross Sills	4" x 4" x 6' 8" *	6
8A	Bolts for Cross Sills	1/2" x 10"	8
9	Floor Planks	2" x 10" x 18'	9 **
10	Manger Ledge	2" x 4" x 17' 10"	2
11	Bolts for Manger Ledge	3/8" x 6" Machine	18
12	Side Stakes	2" x 4" x 4'	16
14	Bolts for Stakes (lower)	3/8" x 4" Machine	36
15	Upper Rail	2" x 4" x 17' 10"	2
16	Bolts for Stakes (upper)	3/8" x 4" Machine	36
17	Angle Iron Brackets	1 3/4" x 1 3/4" x 1/8" x 47 5/8" Angle	12
18	Bracket Part	1 3/4" x 1/4" x 6"	12
19	Bracket Part	1 3/4" x 1/4" x 3"	12
20	Bracket Spacer	2" x 2" x 24"	12
21	Hinge Board	2" x 6" x 17' 10"	2
22	Bolts for Hinge Board	3/8" x 2 1/2" Machine	24
23	Boards for Flared Sides	1" x 8" x 17' 10"	4
24	Boards for Flared Sides	1" x 6" x 17' 10"	4
25	Bolts for Above	5/16" x 3" Machine	96
27	Door Boards	1" x 10" x 8' 11"	4
	Door Boards	1" x 8" x 8' 11"	4
28	Bolts for Brackets	3/8" x 2 1/2" Machine	16

Bolts and Hardware

No. Pieces	Size and Description ****	No. Pieces	Size and Description ****
8	3/8" x 6 1/2" Machine	3 lbs.	3/8" Plain Washers
8	3/8" x 4 1/2" Machine	1 lb.	1/2" Plain Washers
4	1/2" x 12" Machine	1 lb.	5/16" Plain Washers
6	1/2" x 10" Machine	1 lb.	1/4" Plain Washers
16	3/8" x 6" Machine	3 lbs.	20d Common Nails
64	3/8" x 4" Machine	6 pr.	5" Strap Hinges
52	3/8" x 2 1/2" Machine	4	Sliding Bolt Latch (heavy duty)
96	5/16" x 3" Machine	5 lbs.	8d Clinch Nails
30	5/16" x 2 1/2" Machine	4	5" Hooks and Eyes
8	3/8" x 3" Lag Screws		
96	1/4" x 2" Flathead Stove Bolts		

Bolts and Hardware

No. Pieces	Size and Description ****	No. Pieces	Size and Description ****
16	3/8" x 6 1/2" Machine	3 lbs.	3/8" Washers
4	1/2" x 12" Machine	1 lb.	5/16" Washers
8	1/2" x 10" Machine	3 lbs.	20d Common Nails
18	3/8" x 6" Machine	6 pr.	5" Strap Hinges
72	3/8" x 4" Machine	96	1/4" x 2" Stove Bolts
52	3/8" x 2 1/2" Machine	1 lb.	1/4" Washers
96	5/16" x 3" Machine	4	5" Hooks and Eyes
30	5/16" x 2 1/2" Machine	4	1/2" Sliding Bolt Latch (heavy duty)
8	3/8" x 3" Lag Screws		
1 lb.	1/2" Washers	5 lbs.	8d Clinch Nails

Summarized Material Order

No. Pieces	Description	No. Pieces	Description
2	4" x 6" -- 16' Douglas Fir or Oak	9	1" x 6" -- 14' * W. Pine or Hemlock
5	4" x 4" -- 7' Douglas Fir or Oak	1	1" x 6" -- 12' W. Pine or Hemlock
9	2" x 10" -- 16' W. Pine or Hemlock	4	1" x 6" -- 8' W. Pine or Hemlock
2	2" x 6" -- 16' W. Pine or Hemlock	4	4" x 4" x 1/4" -- 12" Angle Iron
2	2" x 2" -- 12' W. Pine or Hemlock	4	2" x 2" x 3/8" -- 4" Angle Iron
4	2" x 4" -- 16' W. Pine or Hemlock	12	1 3/4" x 1 3/4" x 1/8" x 47 5/8" Angle Iron
6	2" x 4" -- 12' W. Pine or Hemlock	12	1 3/4" x 1/4" x 3" Flat Bar Steel
2	1" x 10" -- 16' W. Pine or Hemlock	12	1 3/4" x 1/4" x 6" Flat Bar Steel
6	1" x 8" -- 16' W. Pine or Hemlock	2	2 1/2" x 2 1/2" x 1/8" x 46" Angle Iron
1	1" x 8" -- 14' W. Pine or Hemlock	2	2 1/2" x 2 1/2" x 1/8" x 64" Angle Iron
4	1" x 6" -- 16' W. Pine or Hemlock	2	1/2" x 84" Tie Rod
		4	1/2" Nuts

* For small cows (narrow rack) this part can be ordered 6' long and cut to fit.

** Only 8 planks are needed for 6' 2" and 5' 8" rack widths.

*** For small cows (5' 8" rack width), 12' length boards can be ordered.

**** Bolt lengths here are based on nominal thickness and width of commercial lumber. For home-sawed lumber increase as needed.

Summarized Material Order

No. Pieces	Description	No. Pieces	Description
2	6" x 6" x 18' Douglas Fir or Oak	9	1" x 6" x 14' * W. Pine or Hemlock
3	4" x 4" x 14' Douglas Fir or Oak	1	1" x 6" x 12' W. Pine or Hemlock
4	2" x 4" x 18' W. Pine or Hemlock	4	1" x 6" x 8' W. Pine or Hemlock
7	2" x 4" x 12' W. Pine or Hemlock	4	4" x 4" x 1/4" x 12" Angle Iron
1	2" x 4" x 8' W. Pine or Hemlock	4	2" x 2" x 3/8" x 4" Angle Iron
2	2" x 6" x 18' W. Pine or Hemlock	12	1 3/4" x 1 3/4" x 1/8" x 47 5/8" Angle Iron
9	2" x 10" x 18' W. Pine or Hemlock	12	1 3/4" x 1/4" x 3" Flat Bar Steel
2	2" x 2" x 12' W. Pine or Hemlock	12	1 3/4" x 1/4" x 6" Flat Bar Steel
2	1" x 10" x 18' W. Pine or Hemlock	2	2 1/2" x 2 1/2" x 1/8" x 64" Angle Iron
6	1" x 8" x 18' W. Pine or Hemlock	2	2 1/2" x 2 1/2" x 1/8" x 46" Angle Iron
1	1" x 8" x 14' W. Pine or Hemlock	2	1/2" x 84" Tie Rods
4	1" x 6" x 18' W. Pine or Hemlock	4	1/2" Nuts

The 20 Foot Wagon Rack

Parts

Part No.	Description	Dimension	No. Needed
1	Main Sill	6" x 6" x 20'	2
5	Bolts for Bolster Irons	3/8" x 6 1/2" Machine	8
6	Cross Sills	4" x 4" x 6' 8" *	6
8A	Bolts for Cross Sills	1/2" x 10" Machine	8
9	Floor Planks	2" x 10" x 20'	9 **
10	Manger Ledge	2" x 4" x 19' 10"	2
11	Bolts for Manger Ledge	3/8" x 6" Machine	20
12	Side Stakes	2" x 4" x 4'	18
14	Bolts for Stakes (lower)	3/8" x 4" Machine	40
15	Upper Rail	2" x 4" x 19' 10"	2
16	Bolts for Stakes (upper)	3/8" x 4" Machine	40
17	Angle Iron Bracket	1 3/4" x 1 3/4" x 1/8" x 47 5/8" Angle	12
18	Bracket Part	1 3/4" x 1/4" x 6"	12
19	Bracket Part	1 3/4" x 1/4" x 3"	12
20	Bracket Spacer	2" x 2" x 24"	12
21	Hinge Board	2" x 6" x 19' 10"	2
22	Bolts for Hinge Board	3/8" x 2 1/2" Machine	24
23	Boards for Flared Sides	1" x 8" x 19' 10"	4
24	Boards for Flared Sides	1" x 6" x 19' 10"	4
25	Bolts for Above	5/16" x 3" Machine	96
27	Door Boards	1" x 10" x 9' 11"	4
	Door Boards	1" x 8" x 9' 11"	4
28	Bolts for Brackets	3/8" x 2 1/2" Machine	16

Bolts and Hardware

No. Pieces	Size and Description ****	No. Pieces	Size and Description ****
16	3/8" x 6 1/2" Machine	80	3/8" x 4" Machine
4	1/2" x 12" Machine	96	5/16" x 3" Machine
8	1/2" x 10" Machine	30	5/16" x 2 1/2" Machine
8	3/8" x 3" Lag Screws	3 lbs.	20d Common Nails
6 pr.	5" Strap Hinges	3 lbs.	3/8" Washers
96	1/4" x 2" F. H. Stove Bolts	1 lb.	1/2" Washers
4	Sliding Bolt Latch (heavy)	1 lb.	1/4" Washers
4	5" Hooks and Eyes	1 lb.	5/16" Washers
52	3/8" x 2 1/2" Machine	5 lbs.	8d Clinch Nails
20	3/8" x 6" Machine		

Summarized Material Order

No. Pieces	Description	No. Pieces	Description
2	6" x 6" x 20' Douglas Fir or Oak	4	1" x 6" x 20' W. Pine or Hemlock
3	4" x 4" x 14'* Douglas Fir or Oak	9	1" x 6" x 14'* W. Pine or Hemlock
9	2" x 10" x 20'** W. Pine or Hemlock	1	1" x 6" x 12' W. Pine or Hemlock
2	2" x 6" x 20' W. Pine or Hemlock	4	1" x 6" x 8' W. Pine or Hemlock
2	2" x 2" x 12' W. Pine or Hemlock	4	4" x 4" x 1/4" x 12" Angle Iron
7	2" x 4" x 12' W. Pine or Hemlock	4	2" x 2" x 3/8" x 4" Angle Iron
4	2" x 4" x 20' W. Pine or Hemlock	2	2 1/2" x 2 1/2" x 1/8" x 46" Angle Iron
1	2" x 4" x 8' W. Pine or Hemlock	2	2 1/2" x 2 1/2" x 1/8" x 64" Angle Iron
4	1" x 10" x 10' W. Pine or Hemlock	12	1 3/4" x 1 3/4" x 1/8" x 47 5/8" Angle Iron
2	1" x 8" x 7'* W. Pine or Hemlock	12	1 3/4" x 1/4" x 6" Flat Bar Steel
4	1" x 8" x 20' W. Pine or Hemlock	12	1 3/4" x 1/4" x 3" Flat Bar Steel
4	1" x 8" x 10' W. Pine or Hemlock	2	1/2" x 7' Rod
		4	1/2" Nuts

* For small cows (narrow rack) this part can be ordered 6' long and cut to fit.

** Only 8 planks are needed for 6' 2" and 5' 8" rack widths.

*** For small cows (5' 8" rack width), 12' length boards can be ordered.

**** Bolt lengths here are based on nominal thickness and width of commercial lumber. For home-sawed lumber increase as needed.