CIRCULAR AE-53

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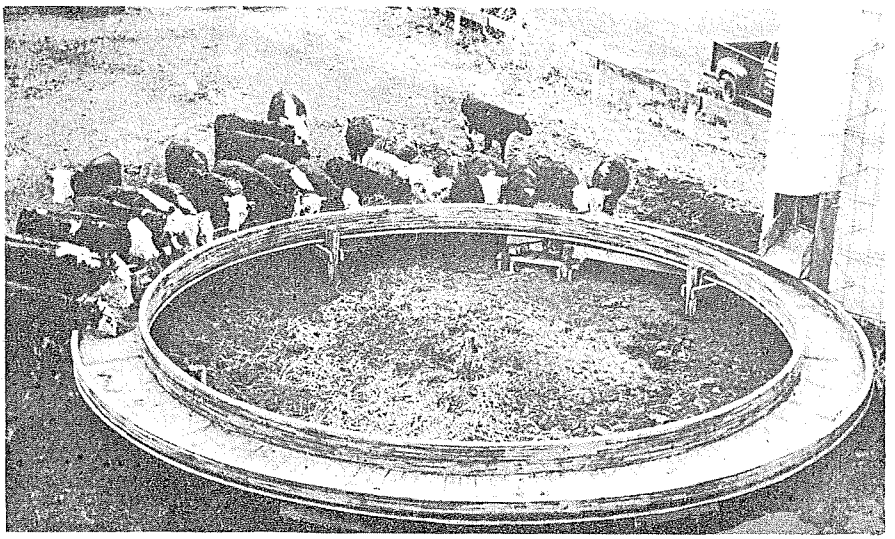
Lazy Susan Feeder



The "Lazy Susan" livestock feeder in actual use, as installed on the Glen Lougheed farm east of Hillsboro, North Dakota.

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LAZY SUSAN FEEDER

The addition of a "Lazy Susan" silage feeder to a farm feed lot may result in a substantial saving in feeding time. The circular bunk rotating under the silo chute eliminates the labor of spreading and distribution and, if silage is pitched down by hand, permits removal of the total daily silage ration with one trip up the silo.

With the addition of a silo unloader and feed conveyor it appears entirely possible to have the entire installation automatically controlled by a time clock. The feeder will have to be adapted to various feed lot arrangements. It may be necessary to use conveyors to deliver the silage from the silo to the feeder, or to install the feeder around the silo. On feeders mounted around the silo, difficulty may be encountered in filling the silo unless some arrangement is made to dis-assemble the feeder, or at least to remove a sizeable section. It would also be a little more difficult to lay out during construction.

The feeder can be used for feeding grain along with the silage by providing a conveyor from the feed storage, or by providing an overhead feed storage directly above the trough. The feeder shown in this plan is 30 feet in diameter and 94 feet in circumference and is capable of handling 50 to 75 head of livestock.

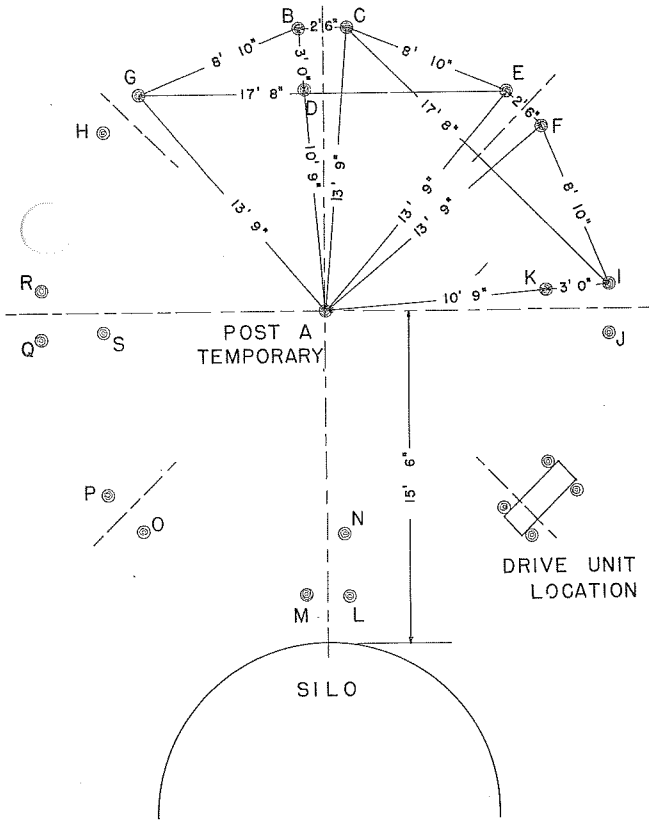

FIGURE 1.—*Layout, showing order for locating posts.*

Layout of Feeder

Layout is simplified by the installation of a temporary center post (A), with a nail in the top to mark the exact center of the feeder. Locate center post (A) 15'6" from silo wall if feeder is to run under silo chute.

To locate support and guide posts:

(1) Using tape line, locate post (B) 13'9" from center post and approximately opposite the silo chute.
(2) Using a second tape line locate post (C) 2'6" from post (B) and 13'9" from center.
(3) Install post (D) in line with center post (A) and post (B) and 3'0" from post (B).
(4) Locate post (E) 13'9" from center and 8'10" from post (C).
(5) Locate post (F) 13'9" from center and 2'6" from post (E).
(6) In like manner locate posts (G) and (H).
(7) Locate post (I) 13'9" from center and 17'8" from post (C).
(8) Locate posts (J) and (K) in same manner as (C) and (D).
(9) Locate guide and support unit (L) (M) (N) directly across from (B) (C) (D).
(10) Locate guide unit (O) (P) directly across from (F) (E).
(11) Check spacing of units. Distance between them should be nearly 8'10".
(12) Locate posts (Q) (R) (S) directly across from (I) (J) (K).
(13) Locate drive unit so dual-drive wheels are half way between posts (L) and (J), the outer wheel to be 13'9" from center post, and the axle to line up exactly with the nail in center post (A).

Alternate method for locating posts:

If a transit or builder's level is available, it should be set directly over the nail in post (A). Locate the posts with the level and a tape, using the angles shown on the large plan, Figure 9.

The 2 x 6 planks which support the wheels shown in Figure 2 should all be level. They can be leveled by using a long straight edge and a carpenter's level or the builder's level, if available.

The support wheels are heavy duty 4 x 8 rubber-tired wheelbarrow wheels which require a ¾" axle. It is important that the axle be mounted so the center of the shaft lines up perfectly with the nail in post (A).

The drive unit consists of a dual wheel driven with a one-third horsepower, 155 revolutions per minute, gear reduction motor. The drive unit needs to reduce the speed of the dual drive wheels to eight or nine revolutions per minute. The complete feeder should make one revolution in about two and one-half minutes.

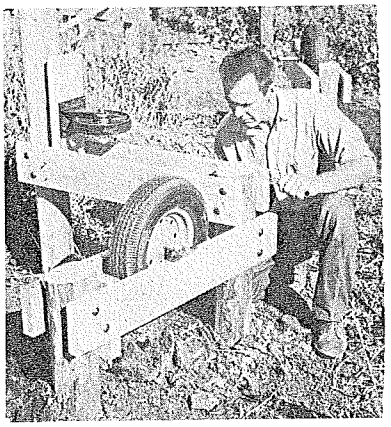

FIGURE 2.—*The support wheels and guide wheels.*

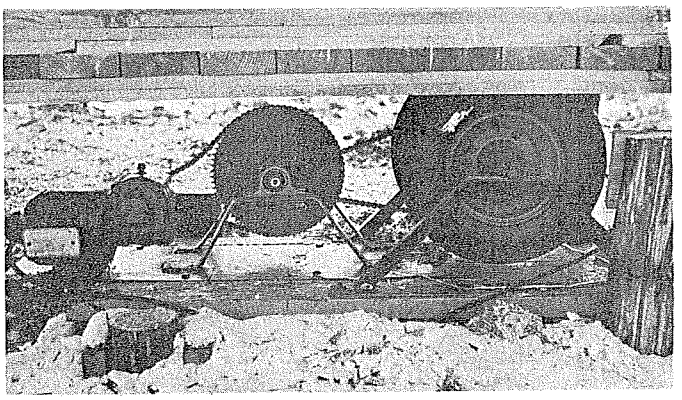

FIGURE 3.—*The drive unit.*

Any satisfactory drive unit may be used that will obtain the above speed. If a gear motor or gear reduction such as shown in Figure 3 is used, be sure to use light oil, such as SAE No. 10W-30, for winter operation. The unit shown uses No. 40 roller chain and sprockets along with the gear motor to obtain the necessary reduction in speed. The motor sprocket has 16 teeth, and drives a 70 tooth sprocket on the jackshaft, and then another 16 tooth sprocket on the jackshaft drives a 70 tooth sprocket mounted between the dual drive wheels. The drive wheels are mounted side by side on a ¾" shaft similar to the support wheels, and the sprocket is held in place between the two wheels with four ⅜" bolts, using pipe spacers to separate the sprocket from each of the drive wheels.

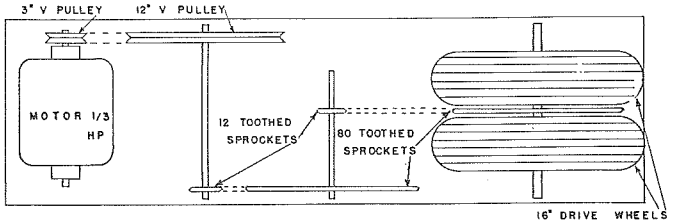

FIGURE 4.—*Alternate drive, using two jack shafts and no reduction gear. The materials are not listed in the bill of materials.*

Construction of Feeder Trough

The feeder trough is constructed of wood with the bottom cut from 2" x 12" fir material and the sides sawed from 1" x 10" pine boards.

Construction of Jig for Sawing Plank: Bottom planks are sawed from 3 foot lengths of 2" x 12" pieces sawed lengthwise at an angle as shown in Figure 9

Make jig, for cutting bottom plank, as follows:

(1) Locate exact center of 2" x 12" x 3'0" plank by drawing diagonal lines from corner to corner.
(2) Stretch a cord 15' long and align with one edge of 2" x 12" as shown in Figure 5
(3) Keeping end of cord stationary at point (P) swing cord over center of plank and mark along cord.
(4) Saw along mark.
(5) Nail a short piece of 1" x 3" to the large end of one of the sawed sections.
(6) This may then be used as a jig or guide for cutting the remainder of the bottom planks.
(7) Set the ripping fence so that saw blade will pass through the center point of plank when placed against the jig as shown in Figure 6

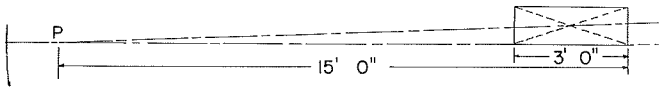

FIGURE 5.—*Jig for cutting bottom plank.*

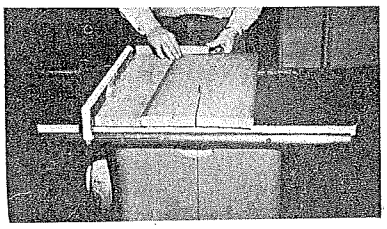

FIGURE 6.—*Using the jig to saw the plank for the bottom of the trough.*

Construction of Jig for Sawing Sides: The sides are cut from 1" x 10" x 4'0" pine boards. The procedure is identical to that used by lumber yards to cut pieces for the sawed-type laminated rafters. The curved pieces for the inside and outside are cut exactly alike and so the curve should have a radius of 13'6" which is an average of the inside and outside radii.

A jig may be made as follows:

(1) Make a platform using two 1" x 10" x 12'0" boards with 1" x 4" cleats on the under side. Arrange the cleats so they do not fall near the middle of the platform where it will lay across the saw.
(2) With a piece of string 13'6" long mark a curved line on this platform running from one end to the other. (See Figure 7.)
(3) A 1" x 2" piece of good quality pine, on edge, is nailed to the platform along the line drawn in step (2).
(4) Using a standard table saw, clamp the platform to the saw in such a way that the curved pieces will be 2½" to 2¾" wide. It may be necessary to shift the platform back and forth to locate the best possible position for sawing. Caution: For safety reasons and for better cutting adjust the blade as low as possible and yet cut through the board. Also use a blade with an extra amount of set to the teeth.

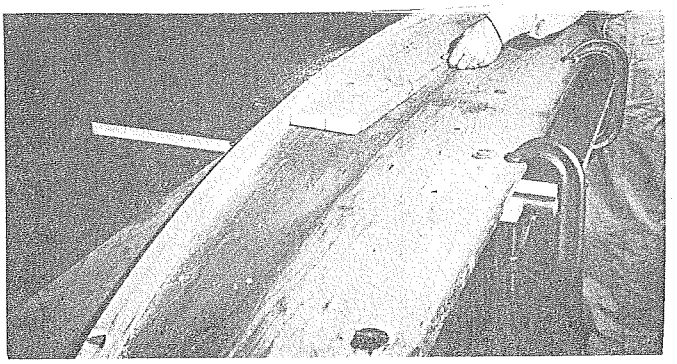

FIGURE 7.—*Using the jig to saw the curved pieces for sides of feeder trough.*

Assembly of Feeder Bunk:

(1) At one point in the circle of the feeder construct a 4' x 6' temporary platform. Using a tape or string from the middle post (A) draw lines on the platform to indicate the inside (12'0") radius and outside (15'0") radius edges of the trough.
(2) Install guides along these lines, using some of the curved side sections, but leaving about ¼" to ½" of clearance on each side.
(3) Lay bottom planks in place, lining them up with the center post (A) using a string or straight edge.

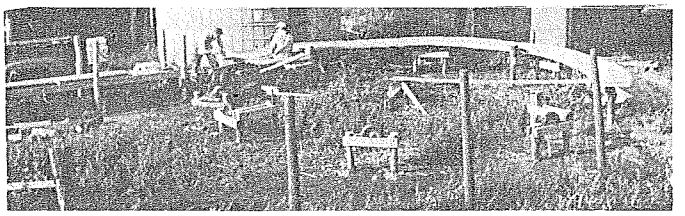

FIGURE 8.—*Feeder unit partly constructed. (Compare with* FIGURE 1, *where this feeder is shown in operation)*

(4) Nail two layers of the side sections to the plank. Be sure to stagger the joints. Cut ends for tight butt joint.
(5) Use a small board 15'0" long for a temporary guide. Fasten it to the center post (A) with a single nail and to one end of the short section of feeder constructed in step (4).
(6) Rotate this short section of the feeder and extend it by adding additional bottom plank and nailing on additional side pieces. Continue the process until circle is completed.
(7) After the circle is completed, add additional layers around outside until the desired height is reached, making sure to rotate the feeder as the boards are nailed on to avoid having any irregularities in the trough.
(8) After the top layers are all nailed on, nail the two layers on each side of the bottom from the under side.
(9) Bolt the sides with 5/16" or ⅜" bolts on about 3'0" centers.

APPROXIMATE BILL OF MATERIALS

LUMBER

Amount Required	Size	Material	Where Used
24 pcs.	2"x12"x12'0"	No. 3 fir	Floor of trough
70 pcs.	1"x10"x12'0"	No. 4 pond. pine	Sides of trough
6 pcs.	2"x6"x16'0"	No. 2 fir	Wheel supports
22 pcs.	5'0"x6"	Treated posts	Support posts

HARDWARE

33	⅜"x9"	Carriage bolts	Sides of trough
26	⅜"x14"	Bolts (to be made)	Sides of trough
60	½"x10"	Carriage bolts	Secure supports to post
36	⅜"x4"	Lag screws	Fasten wheels to supports
16	5/16"x2½"	Bolts	Fasten casters
4	⅜"x5"	Lag screws	Fasten caster base to post
2 lb.	16d	Nails	Miscellaneous
25 lb.	8d	Galv. nails	Sides of trough
3 lb.	⅜"	Washers	Sides of trough
2 lb.	½"	Washers	Supports
10'	¾"	Cold rolled shafting	Axles
2'	1"	Cold rolled shafting	Jackshaft
9	4"x8"	Wheelbarrow wheels	Support wheels
4	8"	Rigid caster wheels	Guide wheels
2	1"	Self-aligning bearings	Jackshaft
1	No. 40-70 tooth	Sprocket, 1" bore	Jackshaft
1	No. 40-70 tooth	Sprocket, no bushing	Driveshaft
1	No. 40-16 tooth	Sprocket, 1" bore	Jackshaft
1	No. 40-16 tooth	Sprocket, to fit motor shaft	Drive
8'	No. 40	Roller chain	Drive
10'	1"x1"x3/16"	Angle iron	Drive unit and support wheels
1	⅓ h.p.	Gear motor—155 r.p.m.	Drive

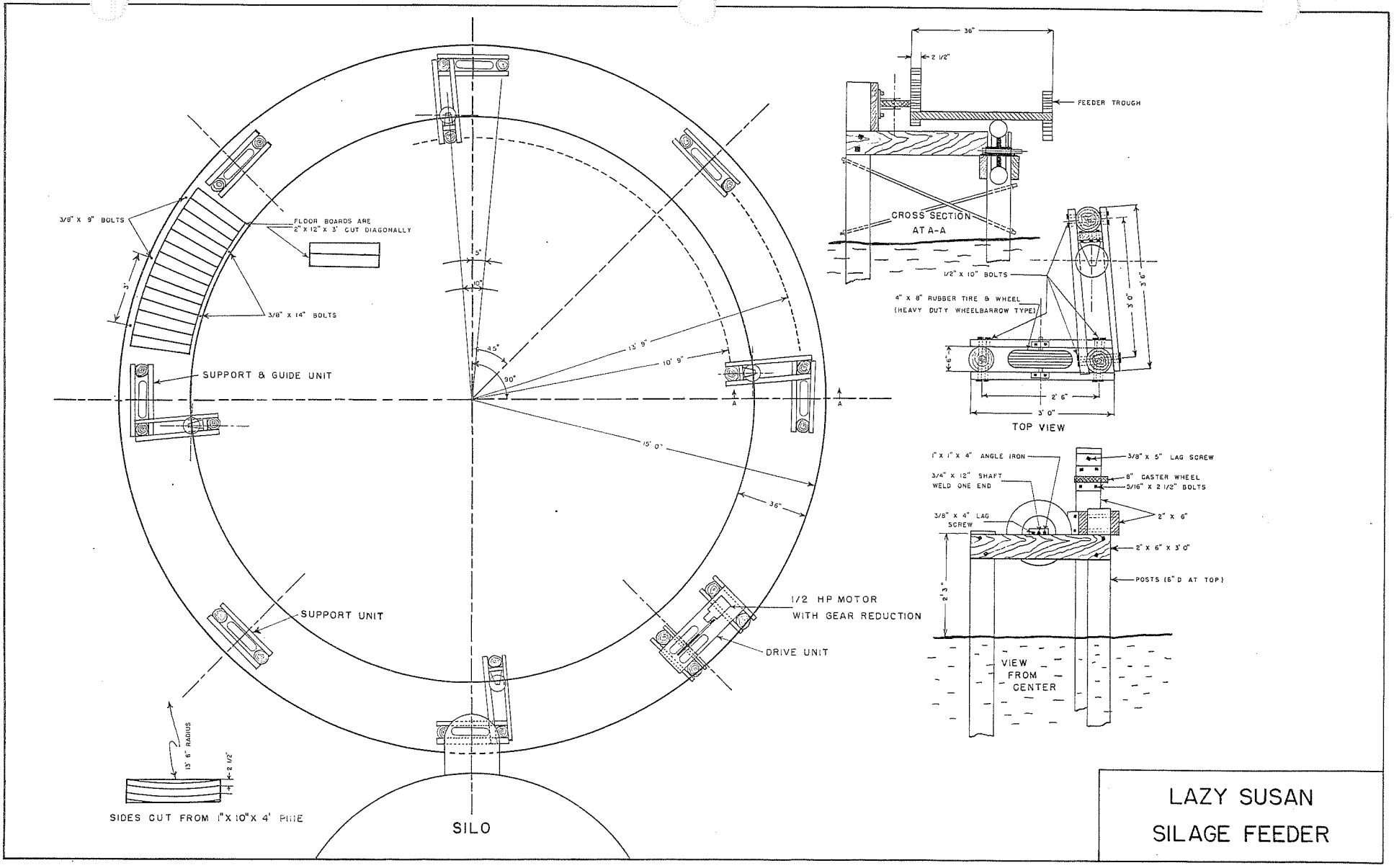

FIGURE 9.—*Layout of the "Lazy Susan." Note location of guide units, of drive unit, and relationship to silo chute.*

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