Division of Agricultural Sciences
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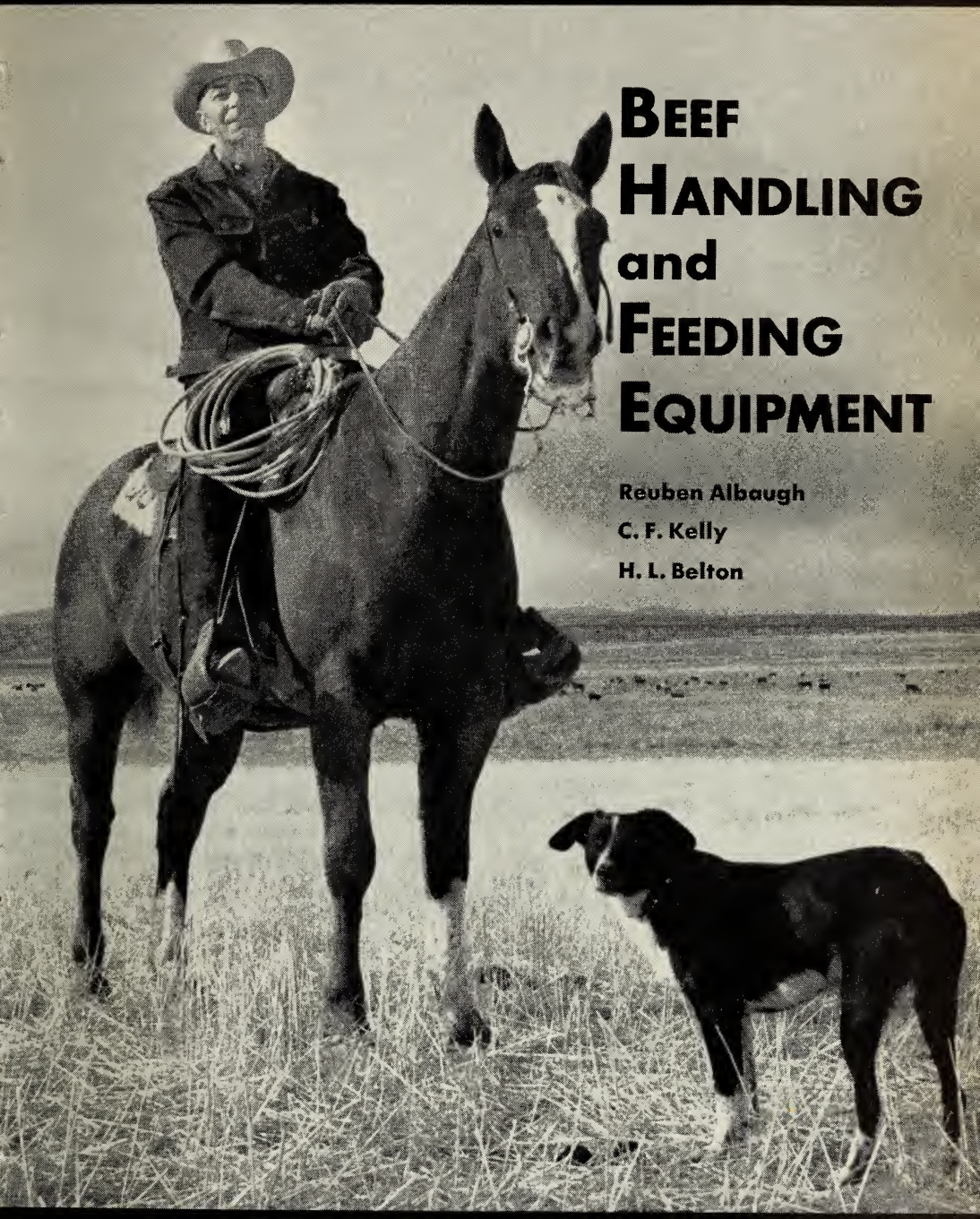

Beef Handling and Feeding Equipment

Reuben Albaugh
C. F. Kelly
H. L. Belton

CALIFORNIA AGRICULTURAL
Experiment Station
Extension Service

CIRCULAR 414
REVISED

BEEF HANDLING and

Livestock damage from bruising and shrinkage can be prevented by careful handling and the use of proper equipment.

Good corrals and equipment should provide facilities for branding, dehorning, loading, unloading, weighing, dipping, parting, and working cattle. They should be planned and built for convenience, economy, and serviceability.

THE AUTHORS:

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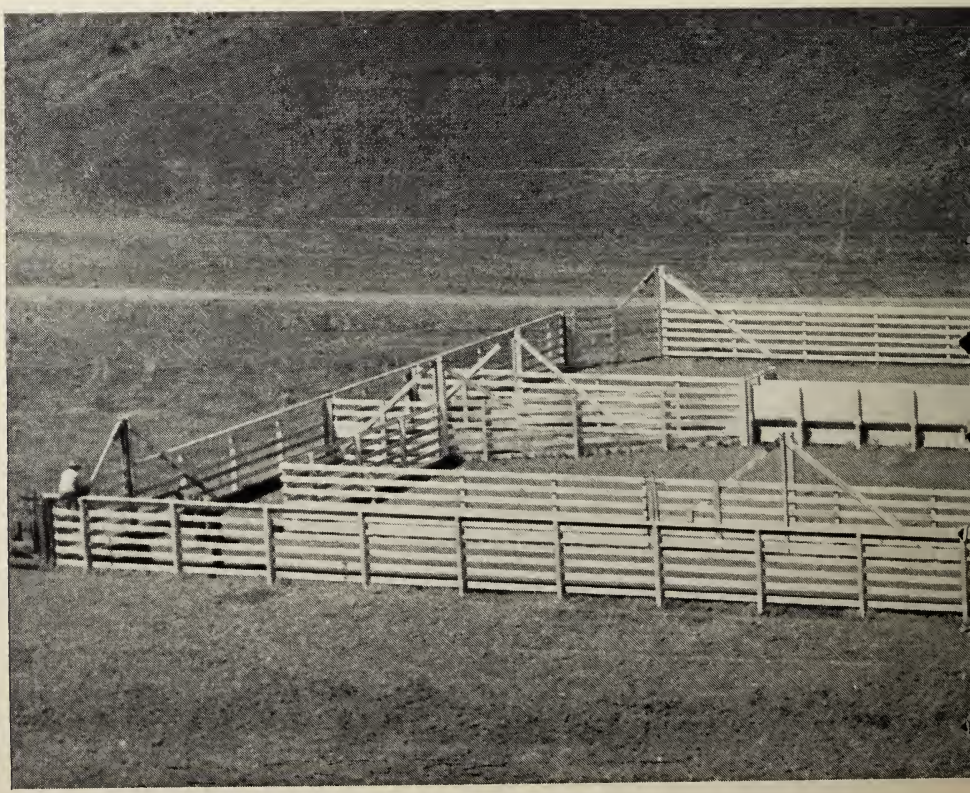
A good corral for handling cattle. Its plan is shown on page 4. The corral is arranged in such a way that cattle can move toward the loading chute when



FEEDING EQUIPMENT

This circular suggests plans for various types of handling and feeding equipment—corrals, loading chutes, scales, feedlots, and the like. There is no one plan to fit every need, but those given can be adapted by the individual cattleman to suit his own requirements.

For information on how to get the plans discussed here, please turn to page 50.

The cover photo shows John Weber, prominent cattleman of Alturas, on his top cow-horse with his dog and other practical working equipment for handling cattle.

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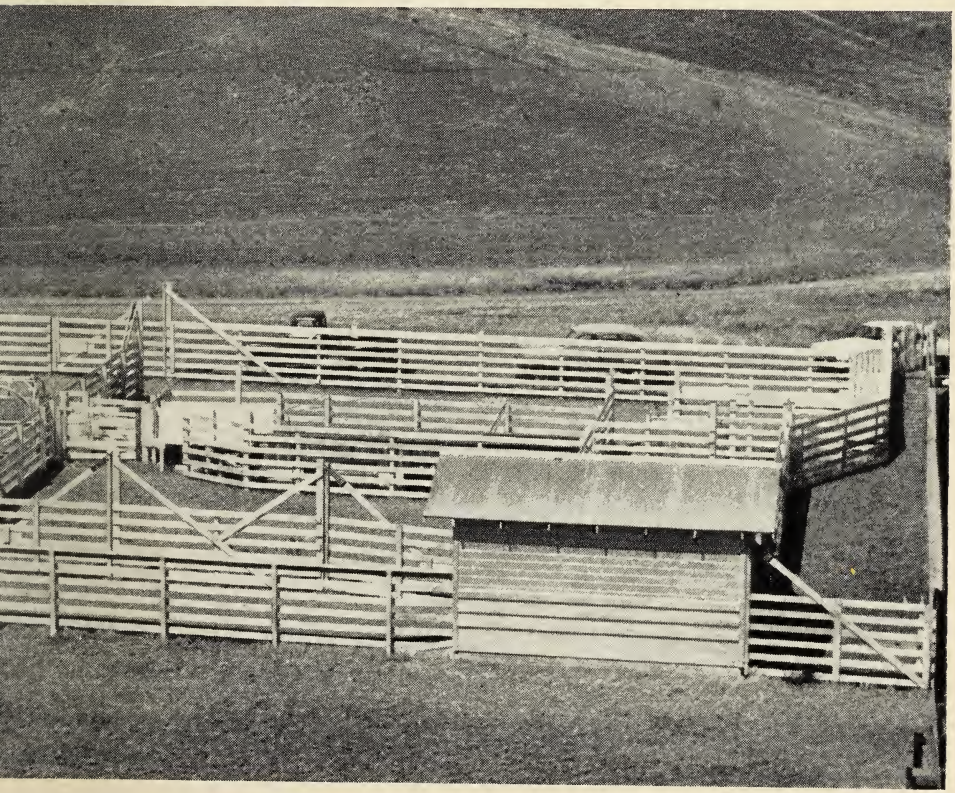
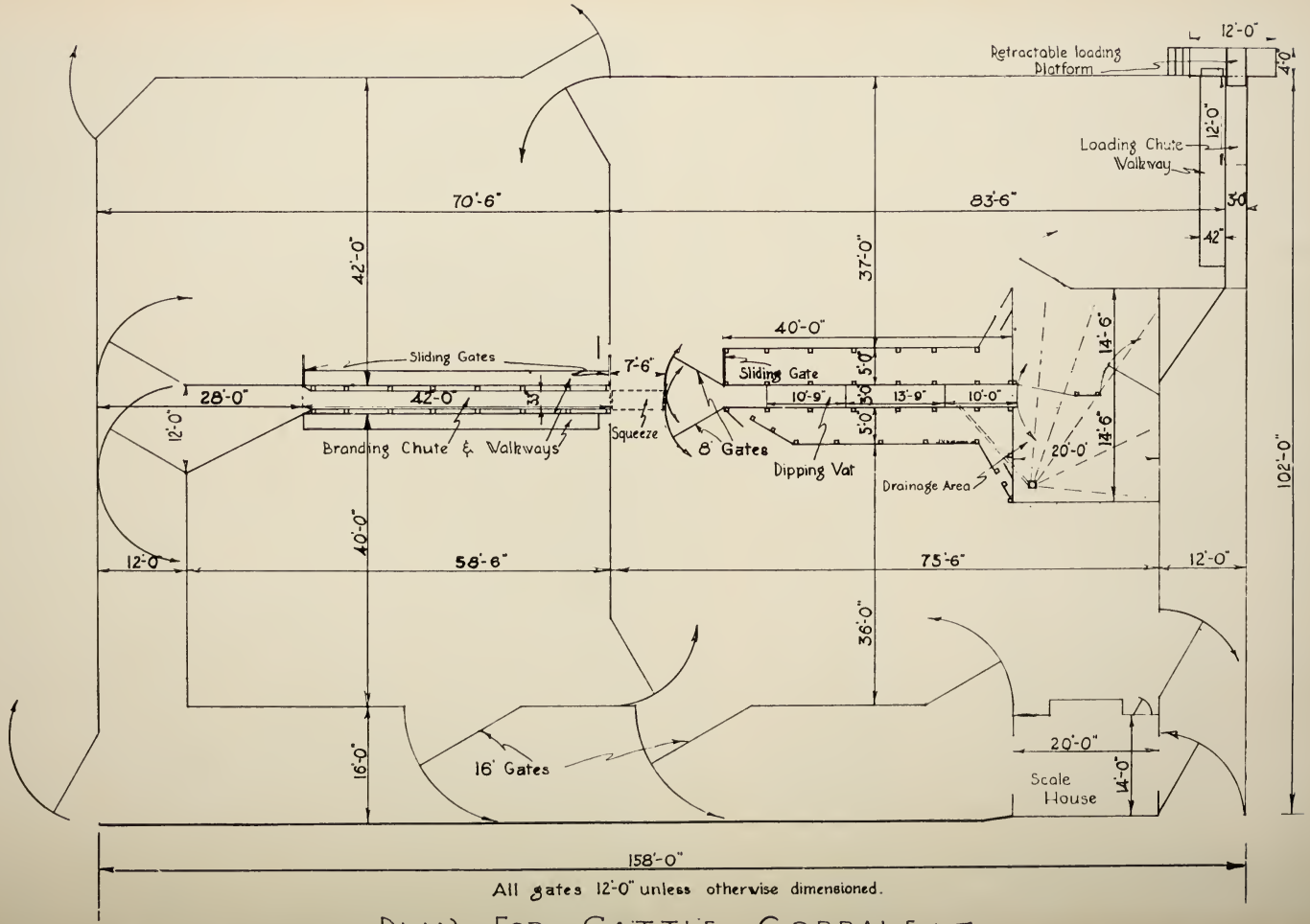
R. ALBAUGH AND C. F. KELLY

being worked through the branding chute and dipping vat. Gates open to form "wings" with chutes; the scale is located out of the direct line of traffic.





All gates 12'-0" unless otherwise dimensioned.

PLAN FOR CATTLE CORRALS

FOR WORKING CATTLE

WELL-PLANNED corrals and other devices make handling of stock easier, save labor, and, most important of all, cut shrinkage, bruising, and other damage to a minimum. Money spent on good handling equipment is one of the best investments a cattleman can make.

By eliminating all carcass losses and damage in beef, veal, lamb, mutton, and pork, the nation's livestock industry can save $81 million annually (approximately $30 million is usually lost from bruises and injury). The plan suggested in this circular have been developed to prevent bruising and shrinkage. However, careful handling is also necessary to avoid these losses.

There is no one plan for equipment such as corrals, scales, chutes, and dipping vats that would be best for all ranches. However, certain features and construction details of a general over-all plan might be usable on any ranch. A good, practical set of corrals and equipment should afford facilities for branding, dehorning, loading, unloading, weighing, dipping, parting, and working cattle. Drinking water should also be made available. In certain areas, shade and some weather shelters are desirable. Corrals and other equipment should be strongly built, and painted to preserve the material. They should not only be built for convenience, but also should be laid out and planned for economy and serviceability.

First build your holding corral

The corral should be in the center of ranch operations to reduce distance in movement of stock. If possible, choose a site on well-drained, sandy-textured soil.

One of the most important considerations is the loading chute. This must be so located that large trucks and trailers can easily reach it at any time. After the location of the loading chute has been established, you can build the rest of the corral around it.

For fencing, 2″ x 6″ unsurfaced lumber is suggested. Double construction on the insides of corrals is recommended so that the outside of the posts will not damage and bruise the cattle. This also makes the corral stronger and more durable. The fence boards may be fastened in place with 20d nails, but ⅜″ or ½″ bolts are preferred. The fences should be 5½ to 6 feet high.

Use posts of redwood, cedar, or some other decay-resistant wood, set 6 feet apart, and at least 2½ feet in the ground. Set corner and gate posts 3 or 4 feet deep. Solid tamping of posts is one of the most important features in constructing corrals for cattle.

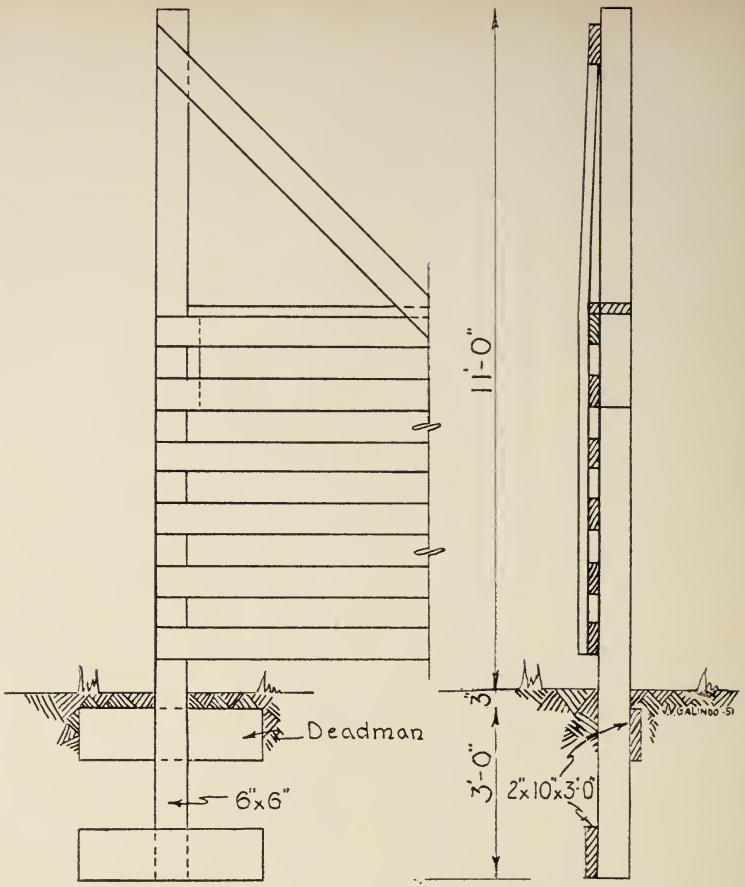
To preserve the posts, treat them with a 5 per cent solution of pentachlorophenol. This material is sold under various trade names, one of which is Permawood. Treatment costs about 5 cents per post.

It is a good idea to reinforce large gate posts with two 2″ x 10″ redwood pieces 3 feet long to act as "deadmen" below the ground. In addition to the deadmen, a 2″ x 6″ may be desirable to tie the tops of the gate posts together (see page 6).

We do not recommend setting posts in concrete. They are more likely to rot, and if broken off, they are difficult to replace.

Gates are very important

There is an old saying that you cannot have too many good gates, and that the efficiency of any ranch is judged by the condition of its gates and the ease with which they operate. It is usually best to place gates in the corners of corrals or other convenient places where it is more or less natural for cattle to go. Wherever possible, the gates should open in the



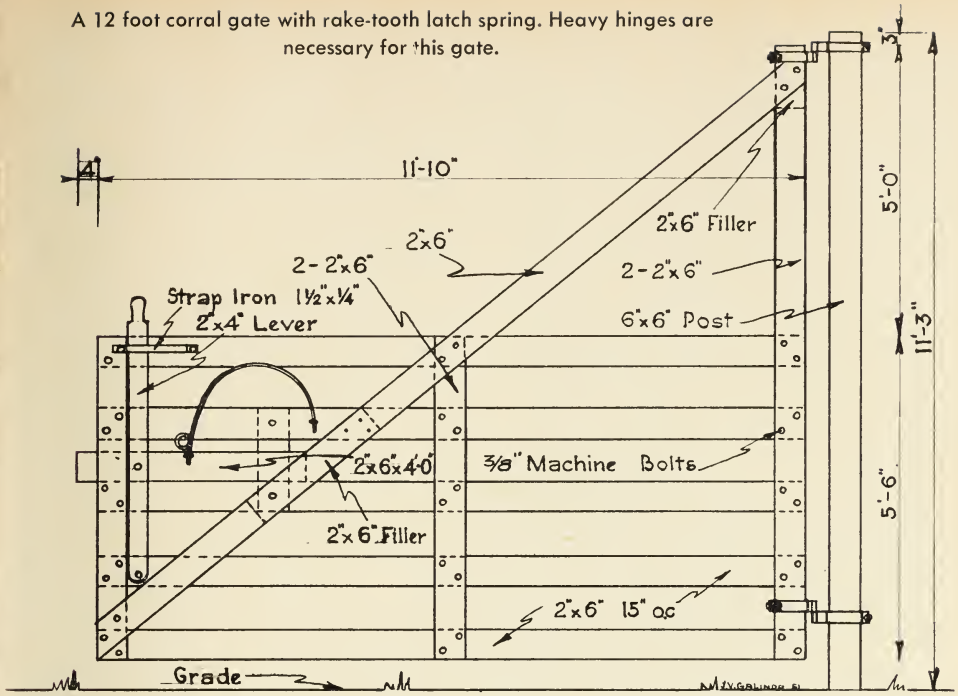
Gate posts and deadmen should be made of redwood or other decay-resistant material. The top piece is nailed on outside of post, just below the ground surface; bottom pieces are on the inside, so that nails do not carry the pressure.

direction in which the cattle are being driven. If practical, gates should be swung so as to make a "wing" with chute, corrals or scales into which the cattle are to be moved. Gates should be built of the same material as that of the corrals, and both bolts and nails should be used in their construction. Build the hinge end of the gate out of two 2" x 6"'s in order to give sufficient surface for the hinge.

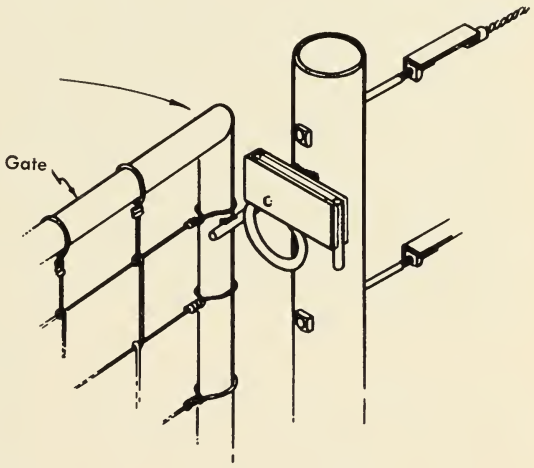
Parting gates may or may not be placed in a chute. Some cowmen prefer to run cattle through a chute and part them with a two-way gate. Some may even want to make arrangements to cut them three ways. Our plan (page 4) calls for a parting gate at the end of the squeeze. It is so placed that cattle can be cut two ways. Other cattlemen prefer to part or sort their cattle in corrals, believing that it is easier on the cattle and causes less bruising and shrinkage.

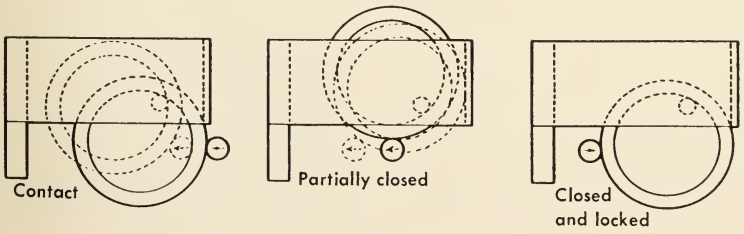
Of the many different types of gates and latches, those shown on page 7 have been found satisfactory on a number of ranches, and are cheap and easy to make. A dump-rake tooth and ring keep the gate from being opened by the cattle. (See page 25 for another gate fastener.)

A 12 foot corral gate with rake-tooth latch spring. Heavy hinges are necessary for this gate.



Ring gate latch for gate. Latch is welded to gate post. Pin on gate lifts ring when gate is closed, but cannot lift it for opening. This latch can be made in a small shop if welding equipment is available.





Branding chute, looking down the entrance end. Note flared ends near the bottom to guide cattle into the chute and prevent bruising. A squeeze can be set up at the far end.

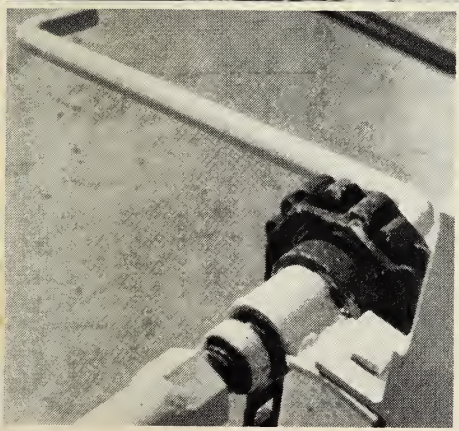
Branding chutes

The cattle-branding chute shown in the drawing above is more or less a dual-purpose chute. Used for branding, spraying, or parting cattle, it is so constructed that both small and large cattle can be worked through the same chute without having the smaller animals turn around and the larger ones become lodged in it. This chute is not practical for extremely thick, short-legged cattle.

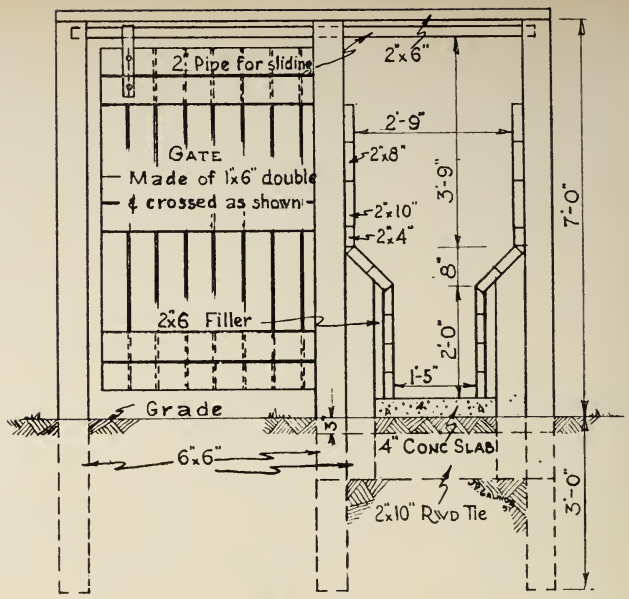
Sides are solid. The chute is 17 inches wide to a height of 2 feet, above which it widens to 33 inches (see detail, top of page 10). For economical construction, five 2″ x 6″'s alternating with 1″ x 6″'s may be used above the 2-foot level. The floor should be concrete, with a broomed finish.

Brace the chutes by nailing 2″ x 10″'s in the ground 6 inches below the bottom of the chute from post to post. It is not desirable to brace the posts by nailing cross ties across the top. This construction interferes with operations such as spraying. Details for constructing these cross ties at the bottoms of the posts are also shown on page 10, with an alternate method, using a concrete cross beam, detailed directly below it.

An adjustable chute, with a side that moves in and out on wheels so that width can be varied from 16 to 33 inches, has been developed by Julius Trescony of San Lucas, and revised for inclusion in the U. S. Department of Agriculture Cooperative Farm Building Plan Exchange Service. The chute is narrow enough for a calf, but wide enough for the largest animal. Three wheels, 10 inches in diameter, support the movable side of a chute 30 feet long (length can be varied if desired). The side is forced back and forth by two large horizontal screws near each end of the chute. One of the screws has a hand crank. A chain running over sprockets connects this screw to the other screw. The movable

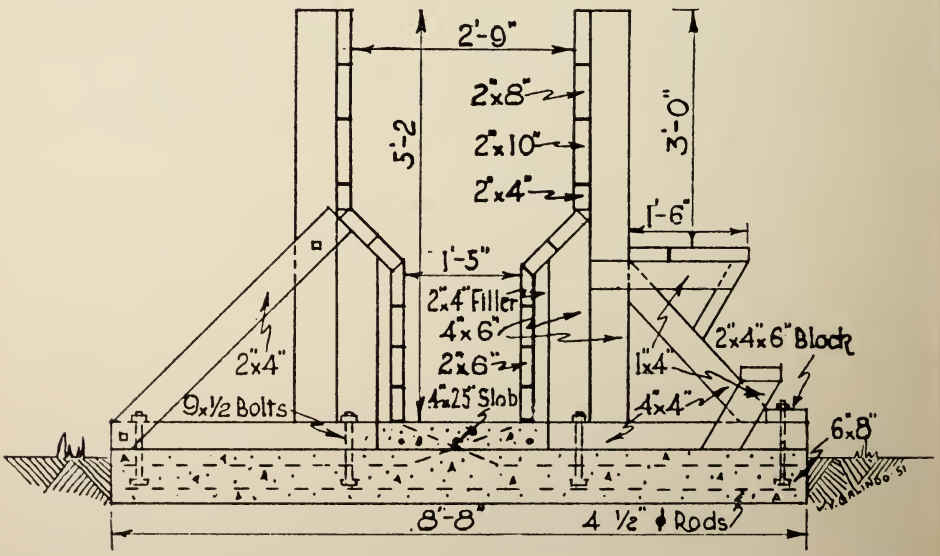


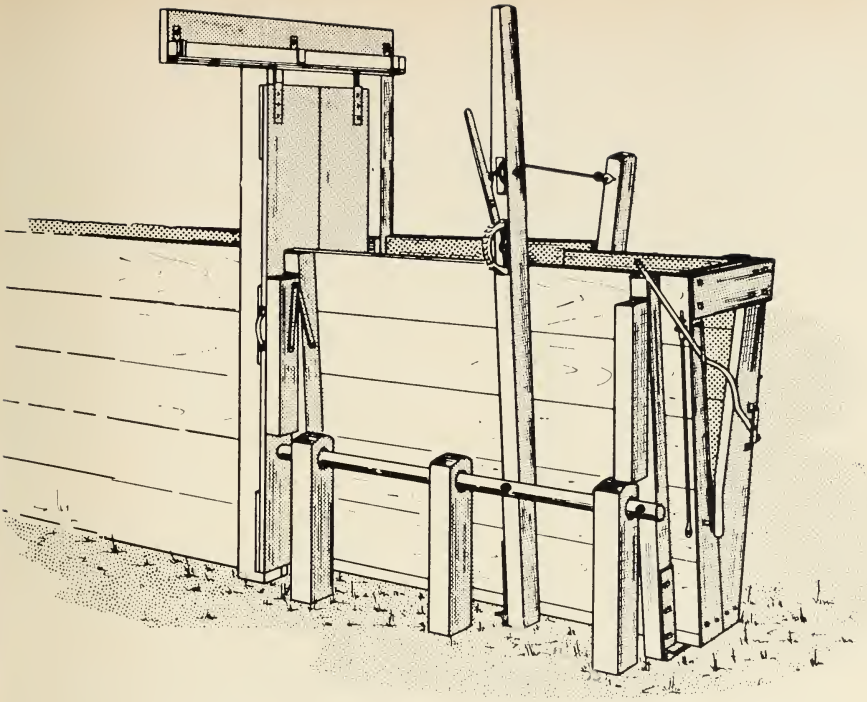
Side view of an adjustable, movable branding chute. Width can vary from 16 to 31 inches. Detail shows hand crank chain and sprocket for adjusting chute.



Construction details of the chute shown on page 8. Treat bottoms of posts with preservative; give concrete floor a rough finish.

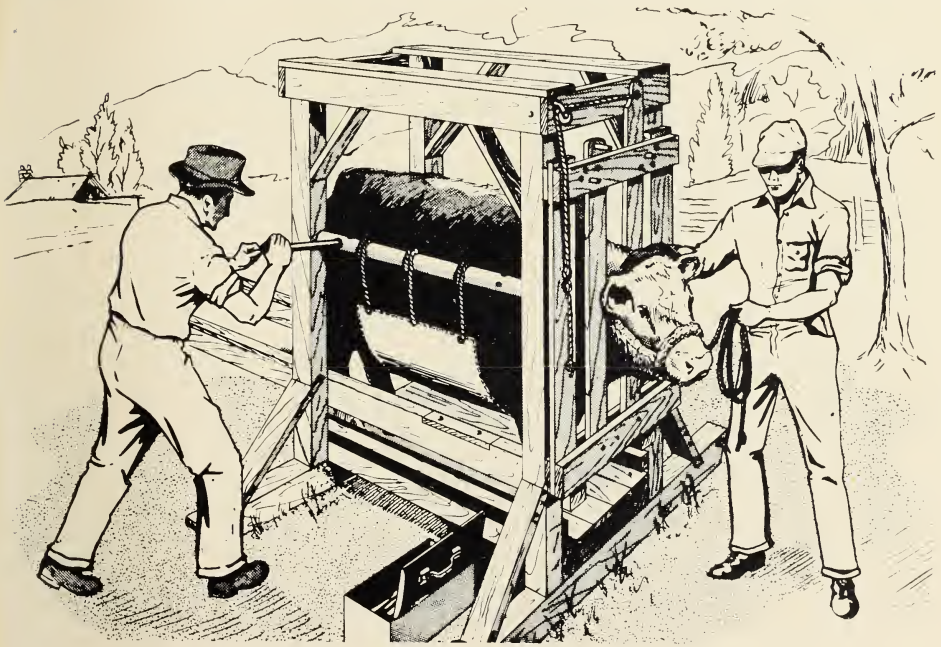
Alternate method of making a chute on rocky soil. Chute is kept in place by weight of the concrete sleepers placed every 6 feet. Detail of man-walk is also shown.

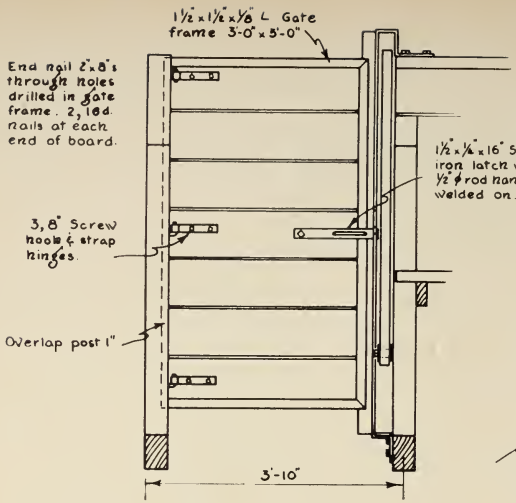




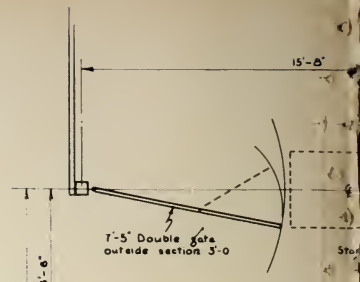
Tilting table (above) for calves. Plan 5962, courtesy USDA and cooperating states. See text, page 15.

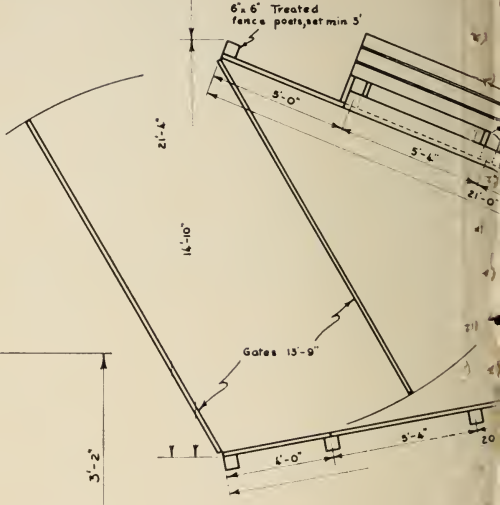
Cattle stock (below). Plan 5740, courtesy USDA and cooperating states. See text, page 15.

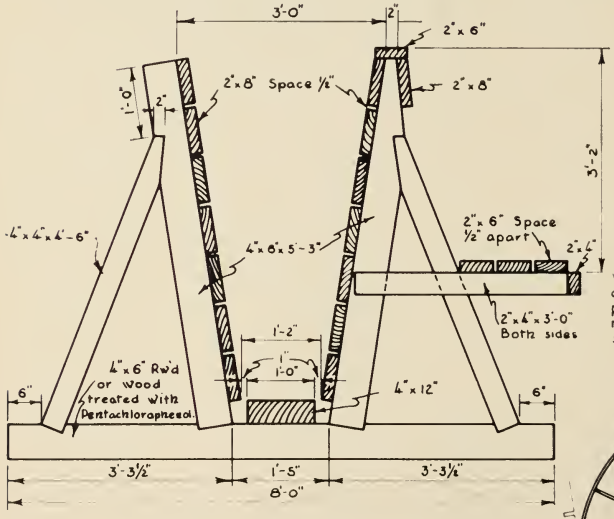




Access gate detail

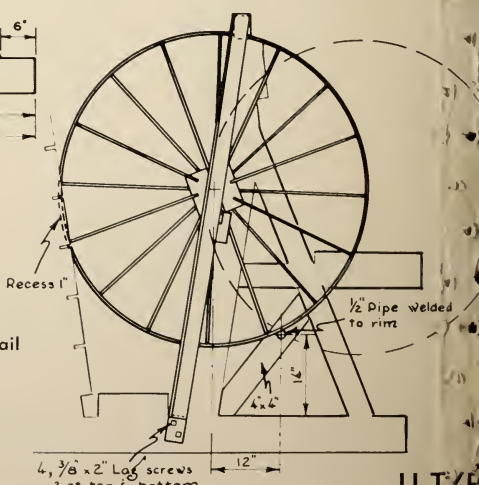






Section A–A

Wheel gate designed from old 54" rake wheel. C... off spokes at hub then bend and weld to ¼" s... plate. Cover chute half of wheel with s... metal securely attached to spokes and rim. Piv... should be at least 12" off centre of wheel as s...



Wheel Gate detail

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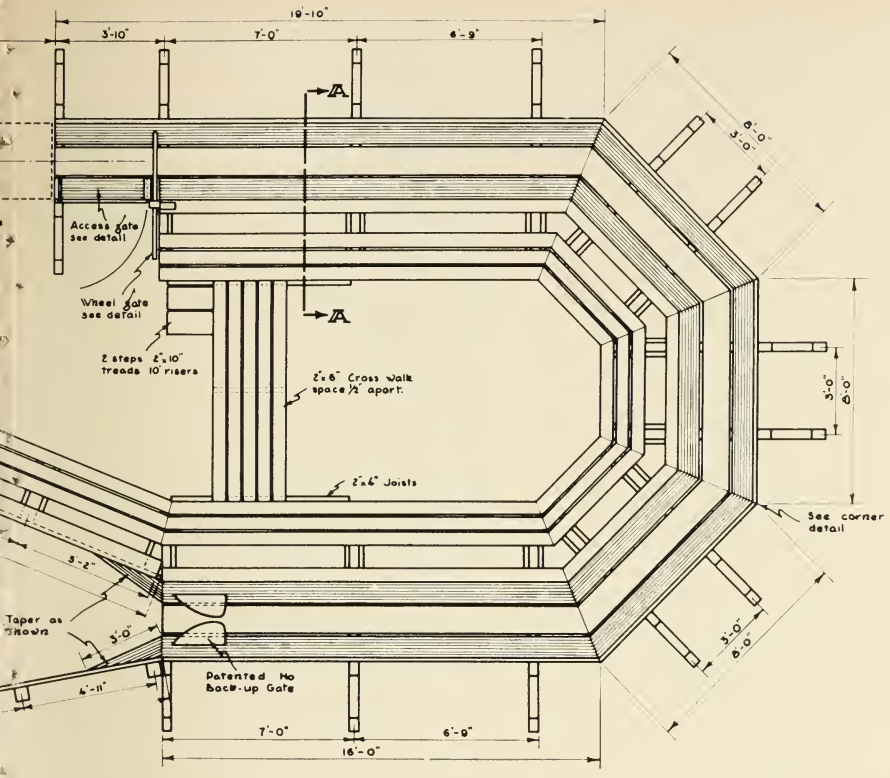
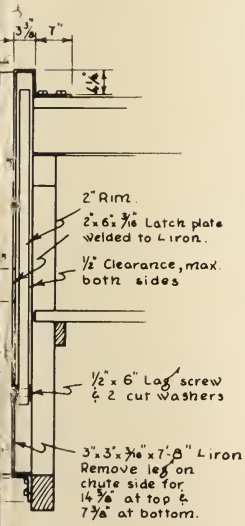
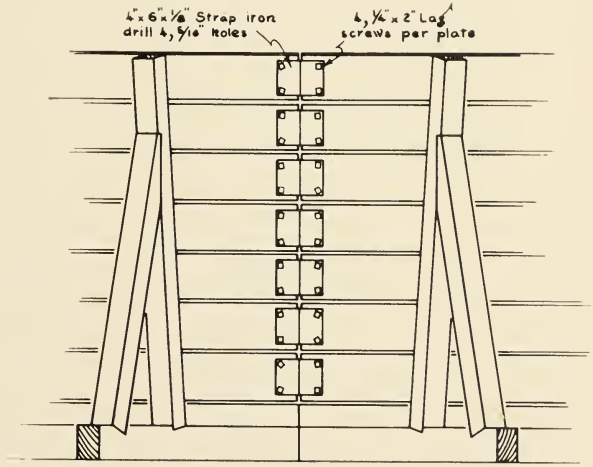






Corner Plates

LITY CHUTE

side is locked into position, after it is correctly adjusted, by a notched arm which temporarily but solidly connects the sides to heavy posts set in the ground.

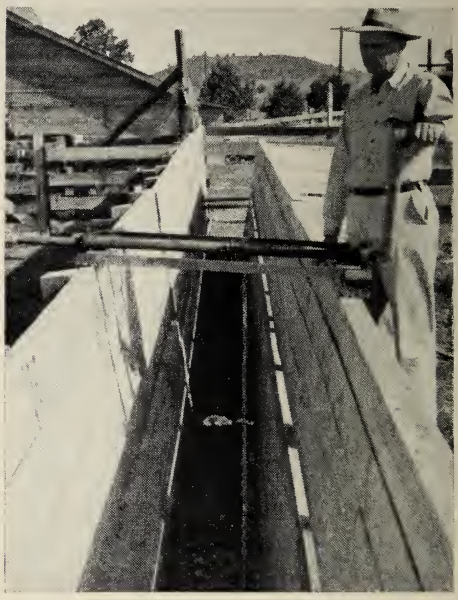
Some cattlemen like curved chutes, believing that cattle will enter them more readily. This type is more difficult to construct and is not so easy to incorporate into the general corral plan. Sometimes the advantages of a curved chute can be obtained through proper location of a straight chute if provision is made for driving cattle into the chute in the direction from which they came. For details of a U-Type chute (developed by Jack Rice of Alturas) see pages 12–13.

A hoist for raising cattle which may go down in a chute is shown on this page.

Walkways are desirable on any kind of chute (see top of page 16).

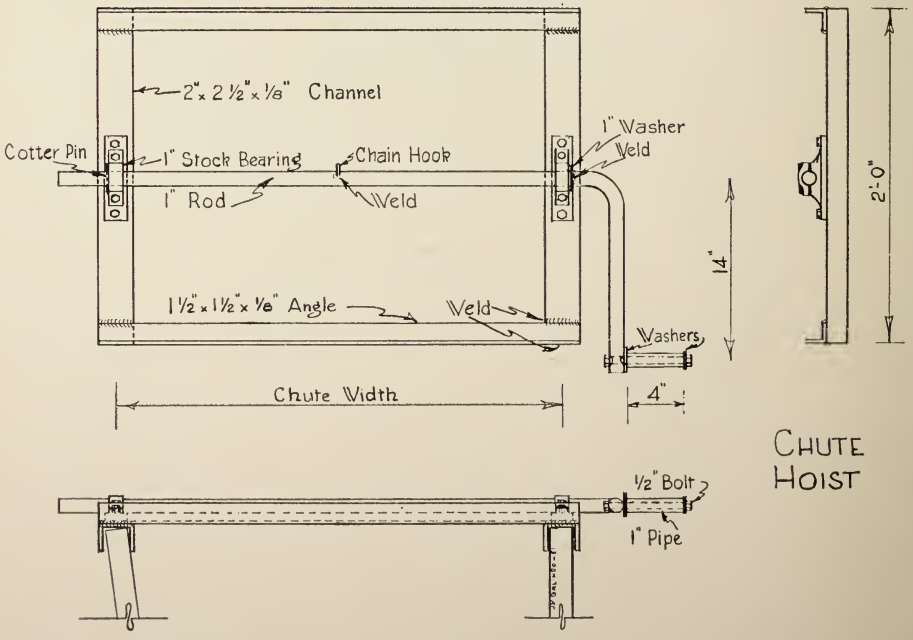
Sliding gates should be constructed at either end of branding chutes by crossing 1″ × 6″'s and nailing well (page 10, top).

The cattle squeeze is highly important. Here most of the work of branding and dehorning is done. Many types are available, but probably the best and most economical over a period of years are commercial squeezes.



The portable hoist (plan shown below).

Portable hoist for raising cattle that go down in the chute. Distance between channels should be the same as width of chute.



A well-designed portable loading chute.

A tilting table for calf-branding (page 11, top) will handle calves weighing up to 500 pounds. The table can be placed at the end of the squeeze, or the squeeze can be removed and replaced by the calf table.

A cattle stock is an important piece of equipment for handling valuable animals. Its use reduces chance of injury to man and animal. This cattle stock, using a canvas sling to raise and support the animal, is portable (page 11, bottom).

A portable loading chute

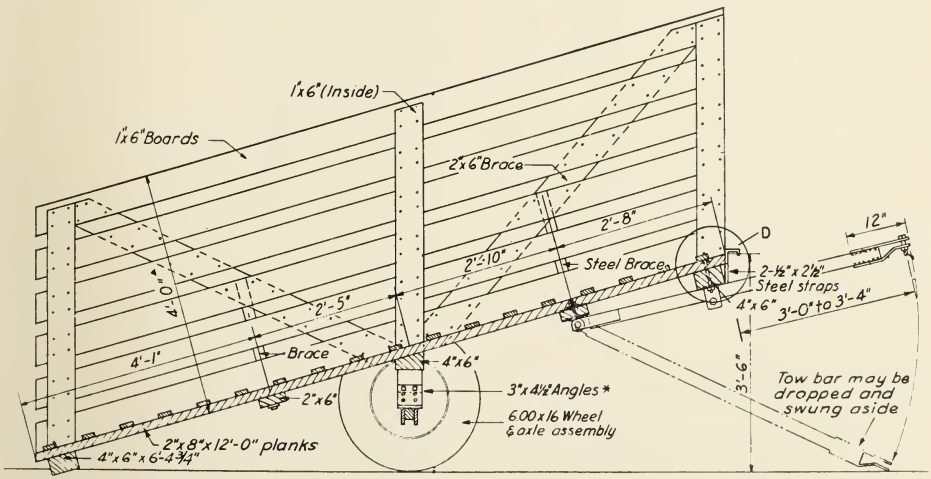
Because most cattle are transported by truck, it may be necessary to have a portable loading chute. Such a chute is convenient because it can be hauled from field to field and can be used for loading and unloading in temporary corrals, such as in beet fields and irrigated pastures.

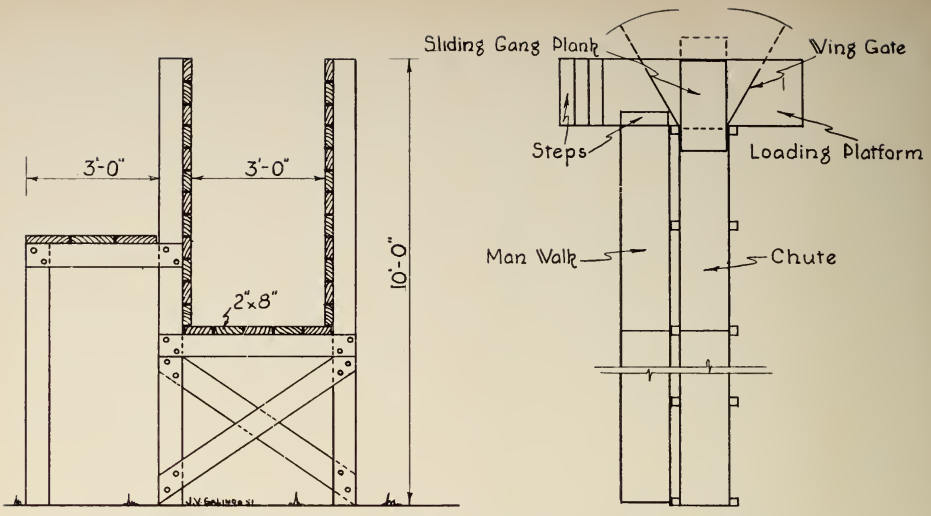
The portable loading chute shown here can easily be hauled behind a truck or trailer and can be operated by one man. It is mounted on retractable rubber-tired wheels.

Loading chute with sliding gangplank

Locate your loading chute so that both large and small trucks and trailers can reach it conveniently at any time of year. Pages 18 and 19 (top) show a plan for a strong, well-constructed loading chute with 16-inch gangplank movement. A desirable feature of this plan, for adjusting the end of the chute that comes into contact with the truck, is shown in detail at top of page 17. It is also important, for easy loading, to have the loading chute long enough so that there is a gradual incline from the corral to the trucks.

Plan for a portable loading chute suitable for towing.





Details of man-walk for loading chute shown at top of pages 18–19.

Reinforce the loading chute by tying the posts at the bottom rather than at the top. The width should be 3 feet in the clear. Construct walkways on both sides of the chute. If they are put on one side only, the left side is the more convenient. Where corrals and equipment are constructed on land that is rather stony, in which setting posts is difficult, chutes can be successfully built on top of the ground by the method illustrated at bottom of page 10. Concrete sleepers placed every 6 feet will keep these chutes in place.

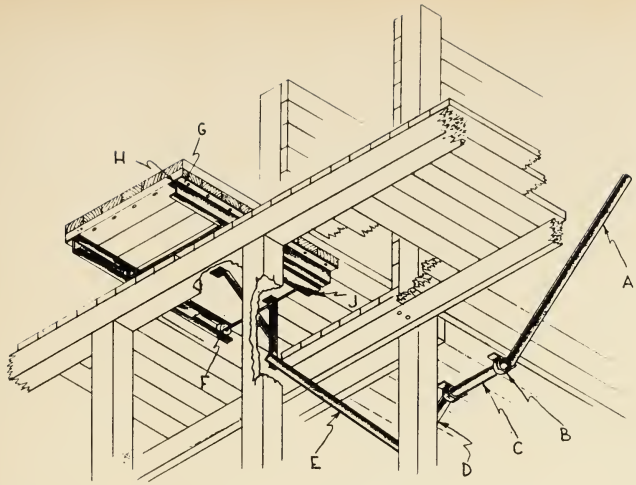
Stepped-ramp loading chutes are becoming popular in stockyards, replacing the sloping ramps. Some cattlemen believe such chutes are safer than the ramps. They require a little less space to install. A run of not less than 18 inches and risers of not more than 4 inches have been found to be the correct proportions for the steps.

Double-deck loading chutes (bottom of pages 18–19) are essential in larger feedlot operations.

Scales are important and need good care

Scales are one of the most important pieces of equipment in the cattle business, and too much stress cannot be placed upon their proper care, treatment, and location. They should be located so that cattle can be worked in adjoining

Stepped-ramp loading chute. Steps should be at least 18 inches wide and not over 4 inches high.



Detail of lever and rollers arrangement for plan shown at top of pages 18–19. Lever A, welded to 2″ shaft C which turns in bearings B, moves gangplank back and forth on rollers F through linkage of pieces D and E. Rollers F, 2½″ in diameter, turn on shafts that are supported by angle J, 4″ x 4″ x ¼″. This angle is bolted securely to the wooden platform. The roller tracks H are of 3″ x 1½″ x 1½″ x ¼″ channels welded to the steel pieces G (¼″ x 3″ x 4′–0″ cold rolled steel). These pieces are bolted to the moving platform. To simplify the detail, wing gates are omitted in the drawing.

corrals without passing over the scales. The only time cattle should cross the scales is when the animals are being weighed.

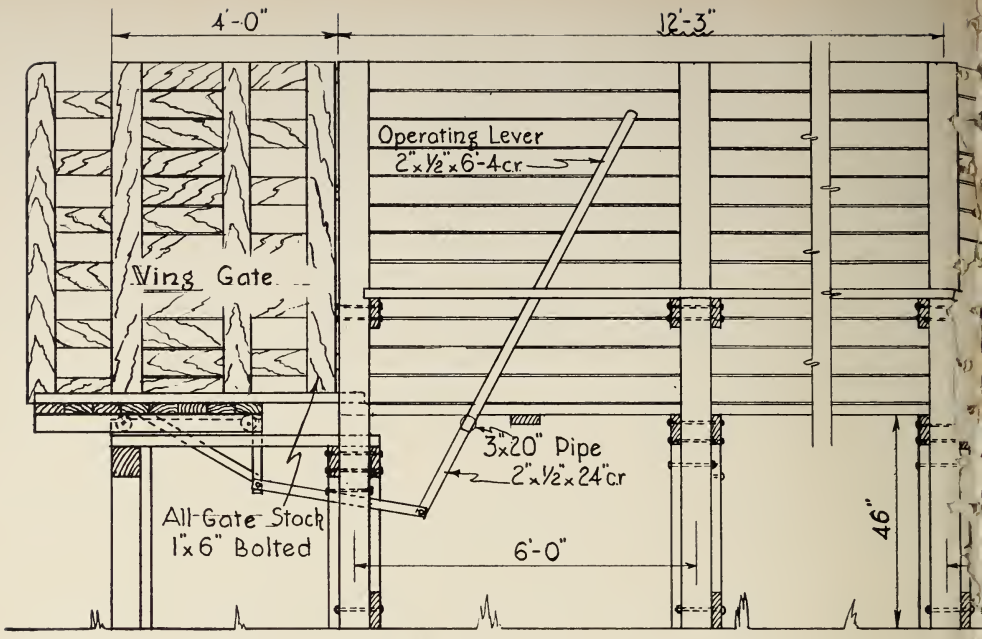
Scales should be of the pit type, and the pit should be built of concrete. Make the pen slightly smaller than the scale platform so that it rests entirely upon it—in other words, the pen becomes part of the weighing platform. Where this is not the case, accurate weighing is impossible. (See illustrations, page 20.)

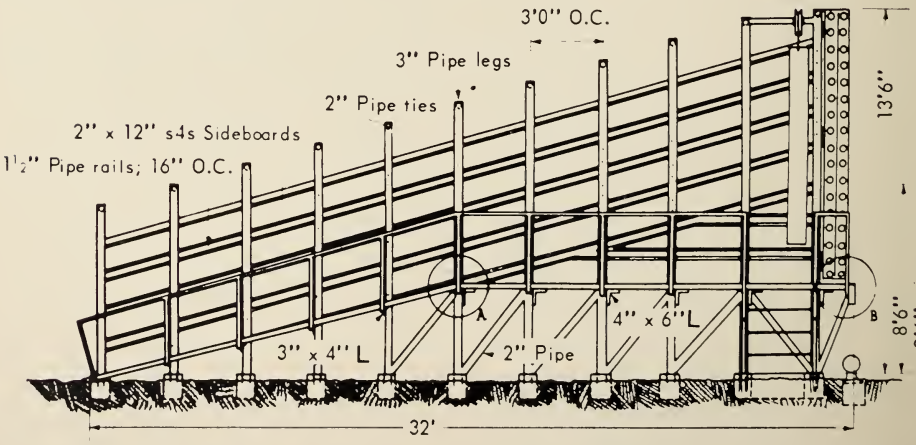
On some ranches it is desirable to remove the scale rack from the scale platform in order to weigh hay or grain on a truck or wagon. This can be accomplished by placing the scale rack on a small track so that it can be removed when necessary. In this case the scale house or shelter must be high enough to provide clearance for the loaded vehicles. If you do not wish to remove the scale rack, bolt it solidly to the platform. The type of construction recommended for the scale rack is similar to that of a rack on a cattle truck.

Scales work more satisfactorily if they have some kind of housing or shelter over them (see page 20). Such housing should be large enough for working space around the scales. The latch for the scale gate recommended here has been found workable and practical. Detail of a rack incorporating this latch is also shown on page 20.

Branding-iron stoves

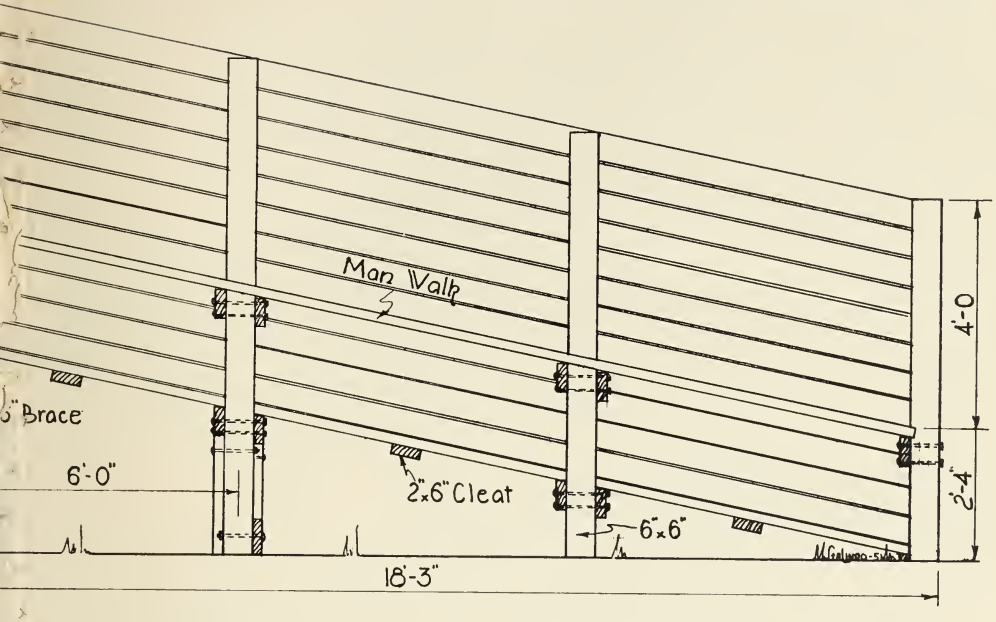
The branding-iron stove shown on page 21, top left, is easy to make and inexpensive to operate. The stove is made from an oil drum with one end left open. Use an acetylene torch to cut a 12″ × 12″ opening in the middle of the drum, on one side. Do not cut away lower part of drum; it helps support the branding iron.

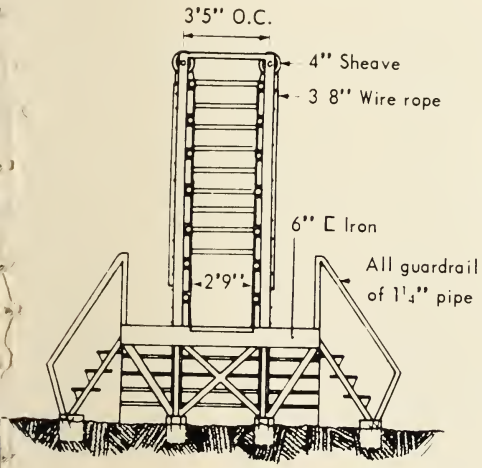

4'-0"
12'-3"
Operating Lever
2"x½"x6'-4cr
Wing Gate
3x20" Pipe
2"x½"x24"cr
All-Gate Stock
1"x6" Bolted
6'-0"
46"

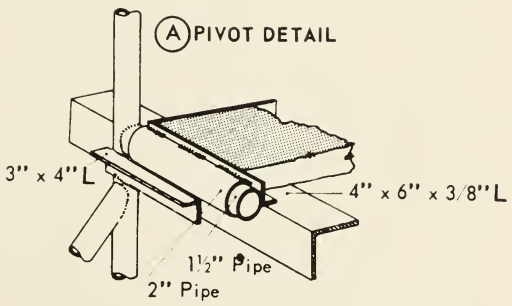

3'0" O.C.
3" Pipe legs
2" Pipe ties
2" x 12" s4s Sideboards
1½" Pipe rails; 16" O.C.
13'6"
Full ra
Do
A
B
4" x 6"L
3" x 4" L
2" Pipe
8'6"
3'6"
32'

DOUBLE-DE

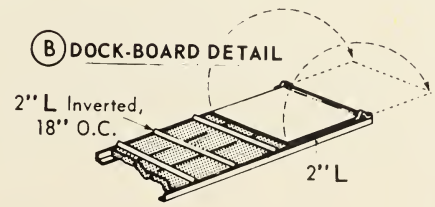
Construction details of loading chute. For details of man-walk with sliding gangplank see top of page 16. For additional details see top of page 17.





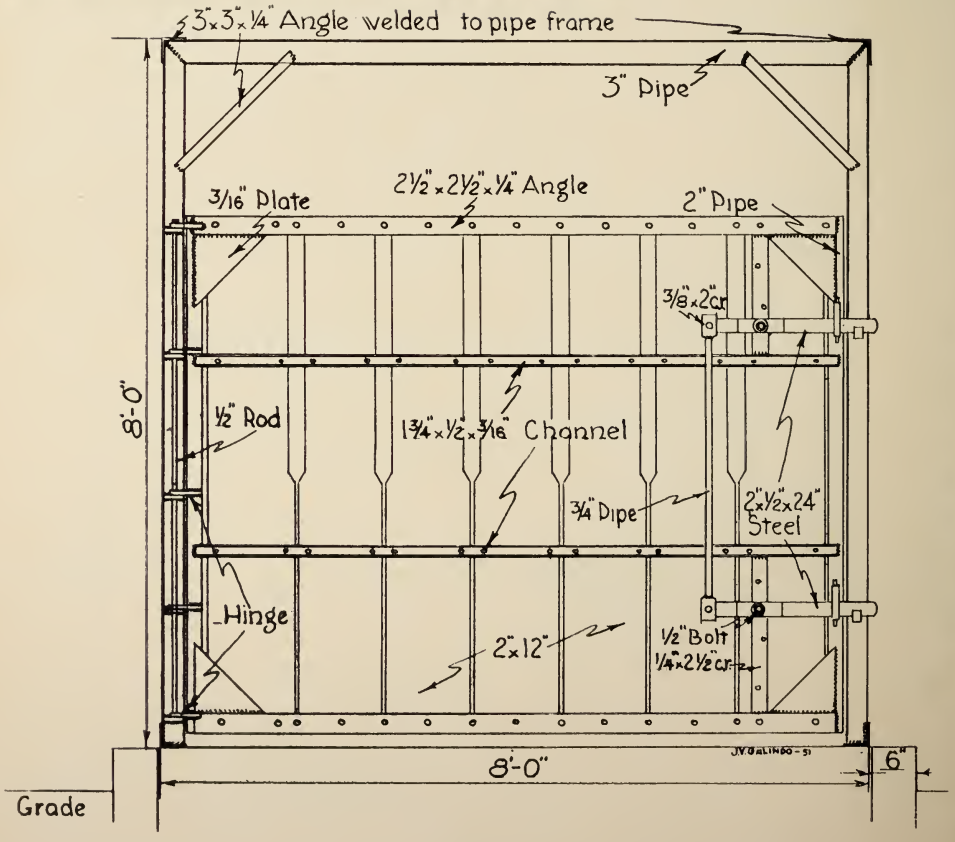


ADING CHUTE



This scale house was built over the scale and rack. One disadvantage of such a house is that the scale rack cannot be removed for weighing trucks or other large equipment.

Scale rack and gate details. The 3" x 3" x 4¼" angles are welded or bolted to the scale bed, and the 3" pipe rack frame is welded to the angles. Double latch insures rigidity.

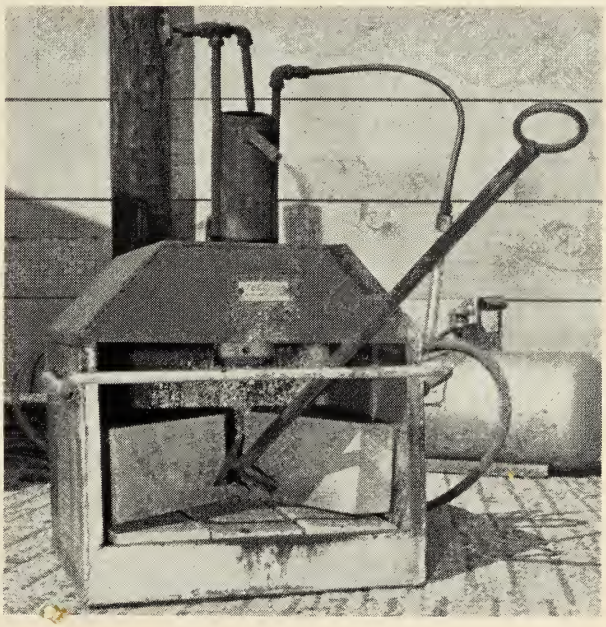


When the irons are to be heated, a wood fire is built in the bottom of the drum. Branding irons are inserted in the opening. Such a stove heats the irons quickly and evenly and at the same time reduces fire hazard.

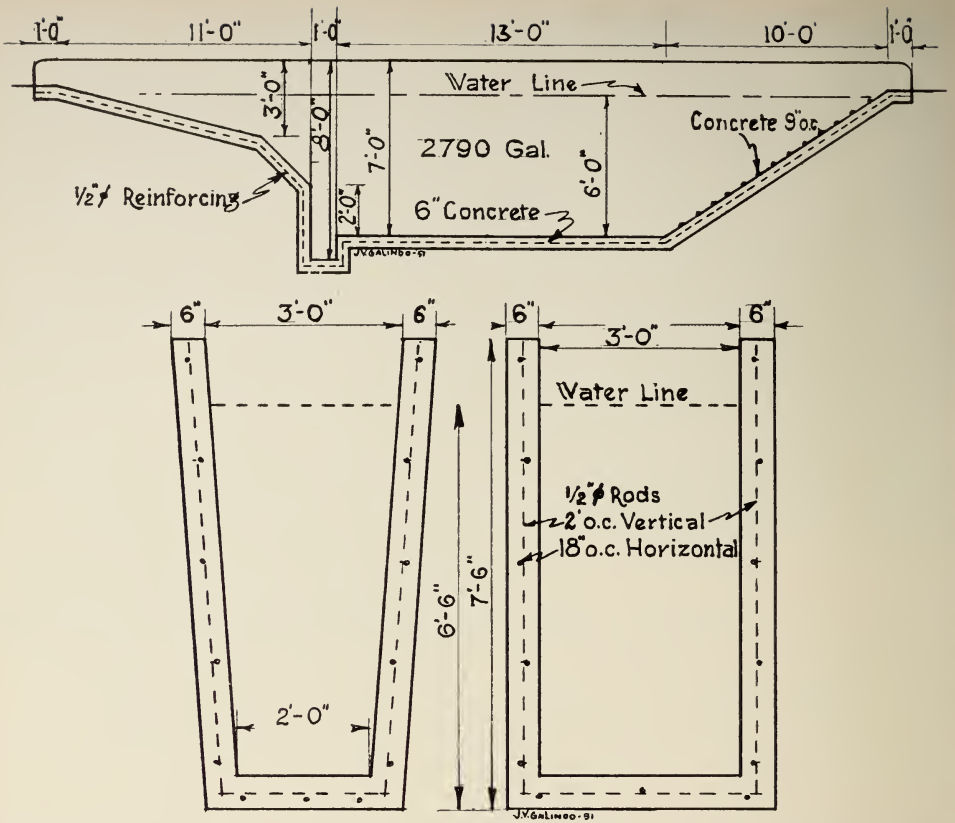
A dipping vat may be necessary

On some cattle ranches dipping vats may be needed to control external parasites, especially lice and ticks. The plan shown on page 22 features a wade-in, which conserves dipping material and makes it easier to drive cattle into the dip. If the wade-in is eliminated, a 30-foot vat is large enough for most ranches, although it can be made larger if necessary. The plan shows longitudinal and alternate cross sections of a concrete dipping vat. The sloping-side type will save a little liquid.

The concrete mixture recommended is 1 sack of cement to 2¼ cu. ft. of sand and 3 cu. ft. of gravel. To insure waterproof concrete, use a minimum amount of water—not more than 5 gallons per sack of cement for this mix, if the sand is moist. (For more detailed information on waterproof concrete to be used in construction, write to the Portland Cement Information Bureau, 564 Market St., San Francisco 94104.)

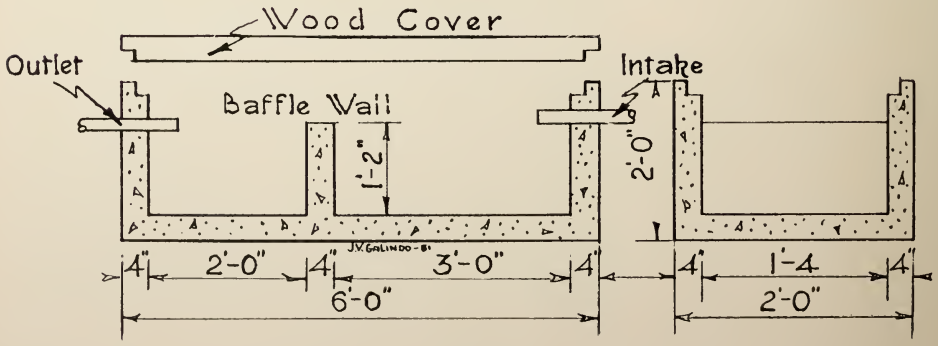


This branding stove, heated with butane gas, can be purchased at livestock equipment stores. It is more popular than the wood stove.



Longitudinal and alternate cross sections of a concrete dipping vat. The sloping-side type will save a little liquid.

A catch or settling basin for removing debris from the dip. This may be installed in the return line from the drain floor to the dipping vat.



A waterproofing paint may also be applied to the vat after it has been constructed. One-half-inch steel rods placed 18″ on centers horizontally and 24″ vertically are recommended for reinforcing the concrete. Approximately 10 cu. yd. of ready-mix concrete will be needed or, if the mixing is done on the job, 60 sacks of cement, 7 cu. yd. of sand, and 8 cu. yd. of gravel (largest size 1½-inch). A total of 525 pounds of the ½-inch reinforcing steel will be necessary.

In constructing the vat, pour the walls first and the bottom as soon after as possible. The drain corral in connection with the dipping vat is arranged so that unused liquid is returned to the main vat. The catch basin shown on page 22 may be constructed in the line between the drain corral and dipping vat. The basin keeps the dip clean by removing debris, and helps prevent waste. It should be installed in the return line from the drain floor to the dipping vat. The lumber used in making forms for the vat can later be used as fencing material for the corrals.

FOR FEEDING CATTLE

Keep these factors in mind: (1) labor efficiency, (2) good drainage, (3) protection of feed from weather, and (4) protection of animals from weather.

The labor cost of feeding cattle is second only to the cost of feed. In the feed corral, arrangements must be made to get the feed to the animals and haul away the manure with a minimum of labor. Gates and the yards themselves should be large enough so that you can operate mechanical equipment for cleaning.

If feed mangers are located along the sides of the corrals they can be filled from the outside, without your entering the yard. Otherwise, stationary or portable bunks may be arranged inside the yard. In either case, access to the bunks by trucks or teams must be maintained in all weather. A concrete slab about 12 feet wide may be constructed the full length of feeding mangers. This structure keeps cattle out of mud and facilitates cleaning.

Whenever possible, the feed yard should be placed on a slope with natural drainage away from the lot. If this is not feasible, construct mounds of dirt in corrals away from the feed bunks. This will afford a place for cattle to lie down. If there is a choice, the yard should be run across the slope of a hill so that the feed road and mangers will be on the high side. Also, the shorter the distance in the direction of the slope, the better the drainage.

Although pavement is expensive, in some cases it may pay to have a strip of concrete 10 or 12 feet wide along the feed mangers. Harvey McDougal, feeder at Collinsville, California, has found that redwood 2″ × 4″'s placed on edge, and extending back from the concrete 10 feet farther, will keep the cattle out of the mud and serve as a place for them to lie down when the feedlot is very muddy. The 2″ × 4″'s and the concrete should have a slope of 1 foot in 10 feet, away from the mangers. In cleaning this type of manger apron, attach a piece of rubber belting to the bulldozer blade to protect the 2″ × 4″'s. "Blacktop" paving will not stand up for long under continuous use by cattle, but it makes a suitable road for the feed trucks.

Allow about 220 sq. ft. of corral space per animal unit. One hundred fifty head is about the maximum number of cattle that can be successfully fed in one lot.

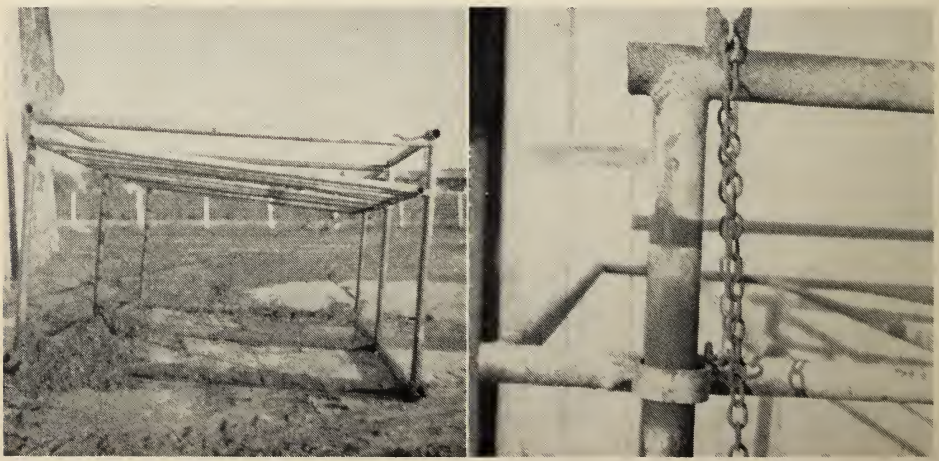
General view of a feedyard. Mounds of earth in the yard provide dry places for cattle to lie down.

Smaller numbers per lot are often more desirable. Cattle should be sorted for feeding on the basis of grade, size, sex, and whether horned or dehorned.

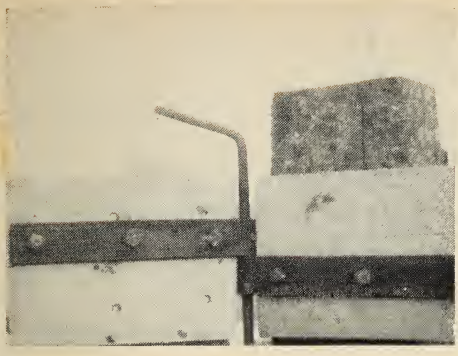
The escape pen shown on bottom of this page keeps cattle from riding each other.

A good gate hinge

The gate hinge shown on top of the opposite page is simple and economical. It is made from the ends of two automobile springs. A 3/8-inch iron rod passes through the holes in the springs to make the gate



Escape pen (to prevent riding). Pen is 5′ 4″ high, 13′ long, and 8′ 6″ wide. Width between pipes on top is 16″, so cattle do not catch their heads. Pen should be located along fence. Details on right shows adjustable top.



secure. Because the metal of the springs is very hard, holes cannot be drilled in it without first reducing the temper. It is therefore necessary to heat the metal and allow it to cool slowly before drilling.

Make strong fences

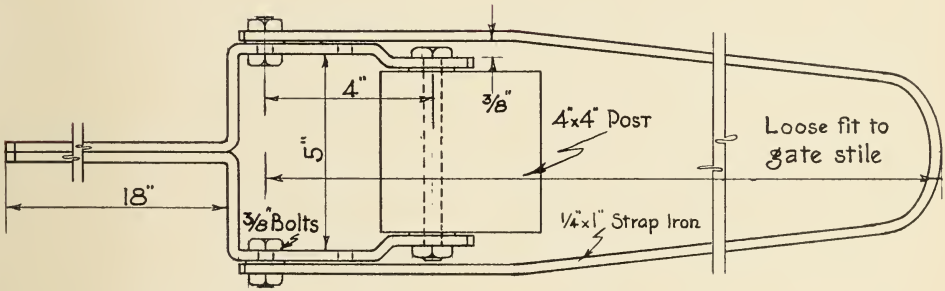
The fence for a feeding corral can be either wood, wire, or cable. It should be at least 5½ feet high with the posts set 8 feet apart. Suitable lumber for corrals is 2″ × 6″ spaced about 6 inches apart. These boards can be either nailed or bolted to the posts.

Woven wire or cable fences are cooler than wooden board fences in hot climates. Boards slow down air motion and reflect solar heat back on to the cattle. Studies in the Imperial Valley indicated animals in a woven wire corral surrounded by green alfalfa gained 0.4 lb. more daily than did animals in a conventional wooden corral.

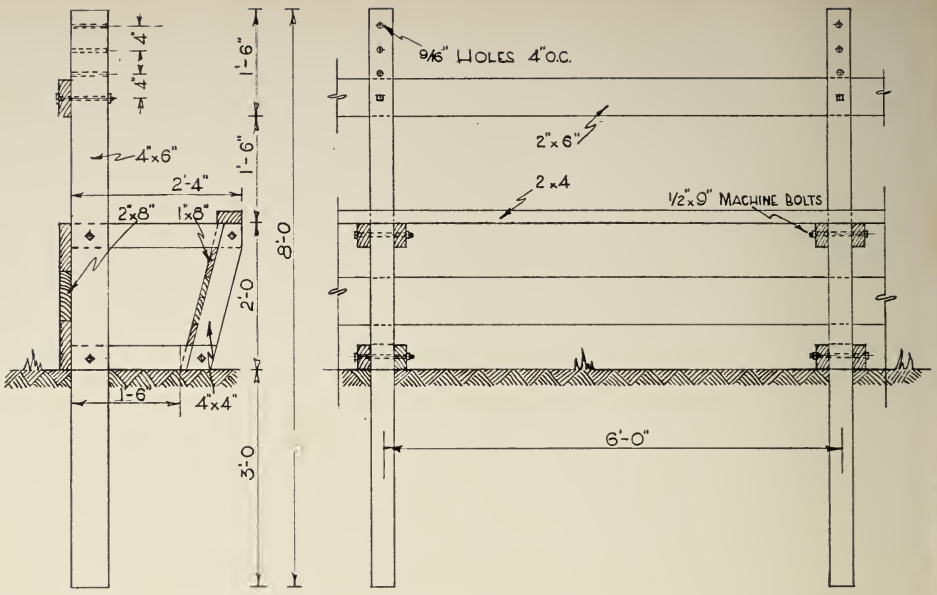
Feed mangers and feed bunks

The requirements of a good feed bunk for beef cattle are strength, tightness, and correct shape and proportions. Where the animals have access to only one side of a manger, allow about 2½ feet for dehorned animals, 3½ for horned animals, and about 2 feet for calves.

A good type of manger for feeding hay



This gate fastener (for which a drawing is shown above) is simple and effective.



This manger may be attached to the outside of the feedyard, and has an adjustable guard rail.

along the side of the lot is shown at top of this page. It is supported on the corral posts spaced 6 feet apart, and the front or side next to the animals is made of three 2″ × 8″'s. No bottom is used. The feed rests on the ground, or on concrete if the lot is paved. The height of the guard rail, to keep the cattle out of the manger, should be made adjustable from 1′6″ to 3′0″ above the manger front by means of holes in the line posts, to allow for growth of the animals.

A manger of the same general type, but with an added backboard that keeps feed from being thrown forward, is shown at top of page 27. The guard rail is replaced by a ½-inch steel cable running through holes in the line posts.

If log rails are available, they can be used for a manger as shown at bottom of page 27. The poles should be peeled. If they are flattened on the side next to the line, posts can be nailed in place with 60d spikes, or held with a wrapping of heavy, smooth wire.

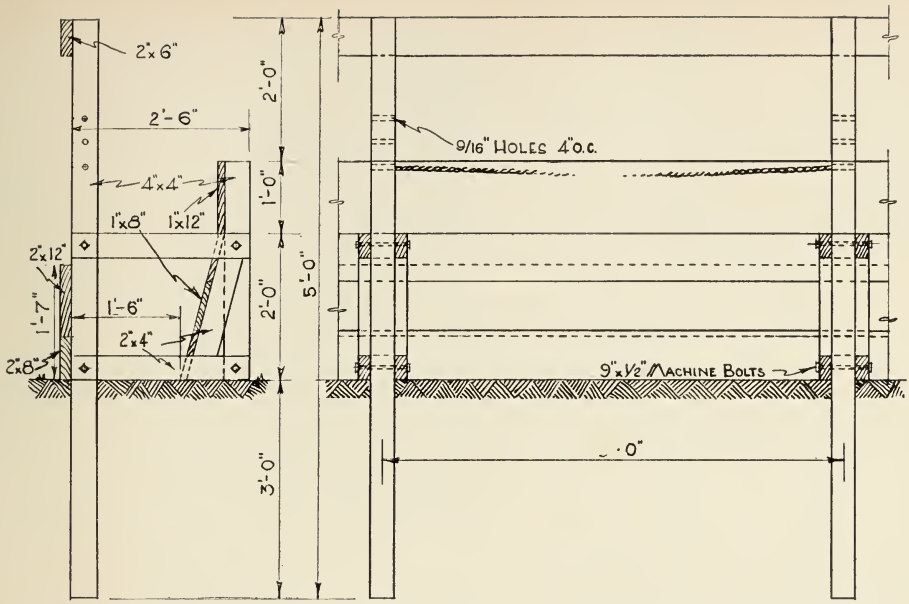
A type of manger well suited for mechanical feeding of mixed chopped feed from a truck with auger is shown at top of page 28. The bottom of the manger is made of sheets of galvanized metal 36″ wide and as long as can be obtained. There are no obstructions to the free passage of the truck auger, and the bottom is smooth and easily kept clear. Fasten the sheets to the wooden rails with large-headed roofing nails.

A satisfactory kind of manger for barn feeding of concentrates to young stock is also shown on page 28. The backboard keeps feed from being thrown forward. The ½-inch cable can be replaced by a 2″ × 6″ if desired.

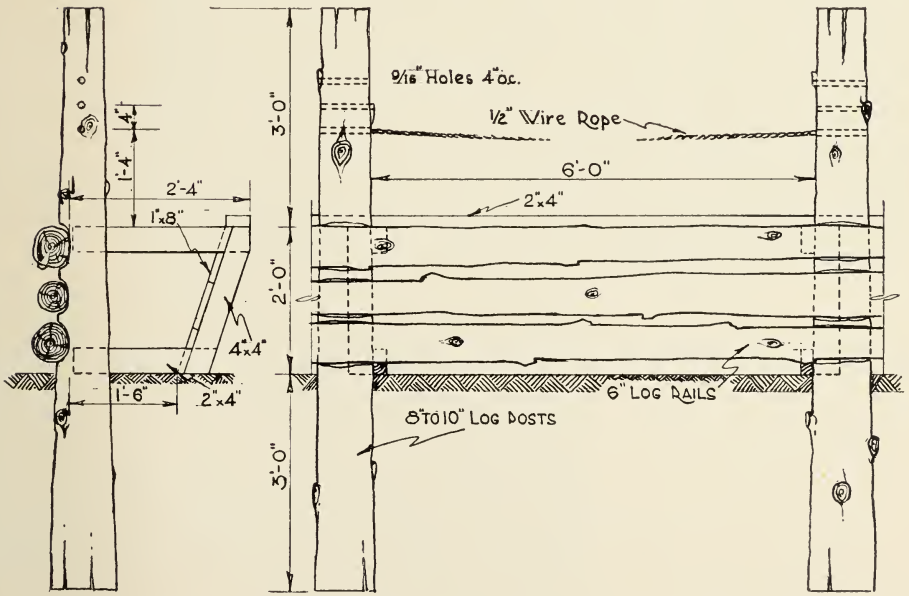
Concrete makes an ideal manger because it is durable and easy to keep clean (bottom, page 29). In some areas, prefabricated concrete mangers are available in 8-foot lengths at a cost of approximately $2 per lineal foot. Mangers can also be constructed of concrete masonry blocks.

Portable feed bunks, racks

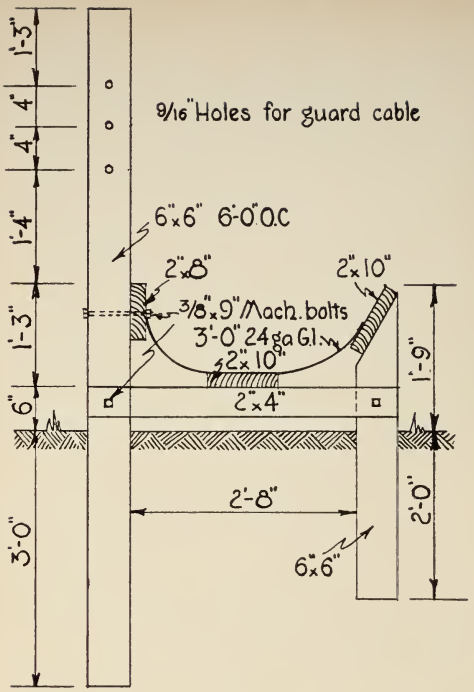
Plenty of weight and width are necessary for a portable bunk used for feeding



Manger for use in a feedyard. A backboard to prevent waste of feed, and a guard of ½" cable is included.



Hay manger that can be constructed against a corral of peeled logs and poles.



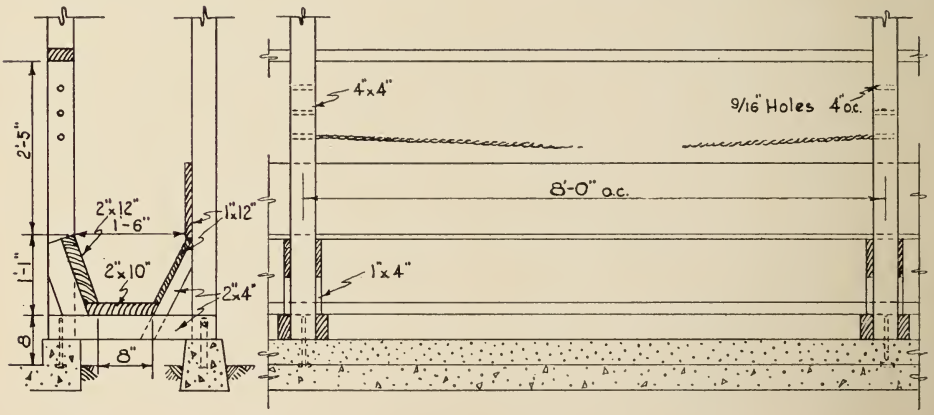
last 12 animals three or four days if fed at the rate of 30 pounds per head per day.

A successful trailer for hauling feed is shown in the photos on page 36. It is 16 feet long, 8 feet wide, and 4 feet high, and has a capacity of 3½ tons of green chopped material. A 3-foot canvas is placed around the top to keep the hay from being scattered by the wind. An ordinary Fox field chopper is used to pick up the hay, chop it, and blow it into the trailer. Trailer and chopper are pulled by a Farmall tractor.

It takes about 20 minutes to load the trailer, which is then unloaded by 4 endless chains equipped with angle-iron cleats 1½ inches high placed every 4 feet. These endless chains operate from a power take-off from the tractor. The wheels on the trailer are airplane type. The main body is steel and the sides are of wood.

Manger with galvanized iron bottom for use with mixed feeds.

Below: manger suitable for feeding concentrates in a shed or barn.

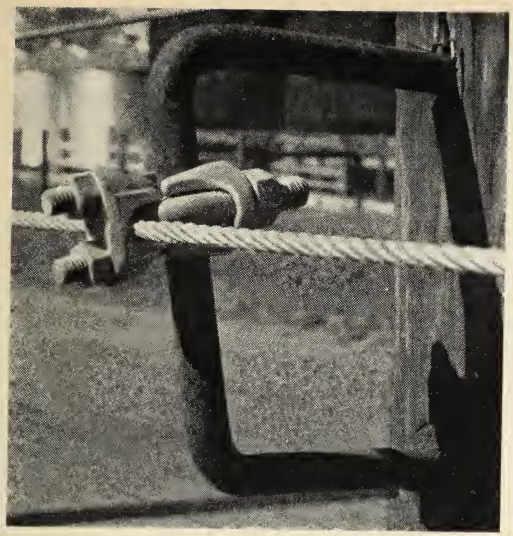


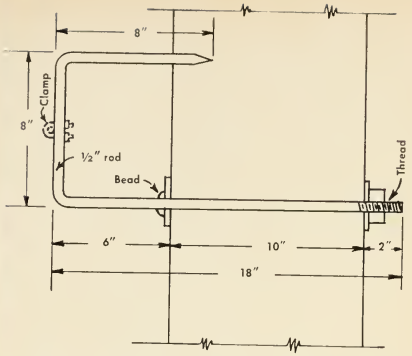
silage and concentrates in the corral, to prevent tipping. Such a bunk is also desirable for feeding concentrates on the range or on irrigated pastures. It can be moved by lifting with a fork lift on the front of a tractor, or 4″ x 4″ skids can be attached to the legs. (See page 30.)

A portable rack for feeding hay in the corral or pasture is also shown. When filled, it has a capacity of 300 cubic feet, or about ⅔ ton of long hay—enough to

Self-feeders save labor

Self-feeding of concentrates and chopped hay is a practical labor saver, especially in range feeding or in connec-



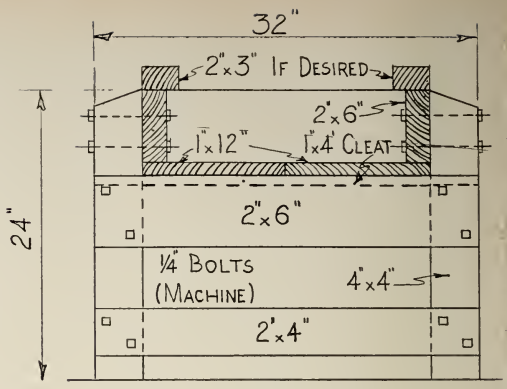


Cable extender with clamps for adjustments. This feature allows an animal to reach the feed, cuts down feed loss, and prevents animals from escaping. Extender should pass through posts, with both ends fastened by a washer and nut.

Cable tighteners. To keep cattle from loosening cables, a nut should be placed at end of screw eye. On 5′ posts, cables are 9″ apart with lowest 12″ off ground.

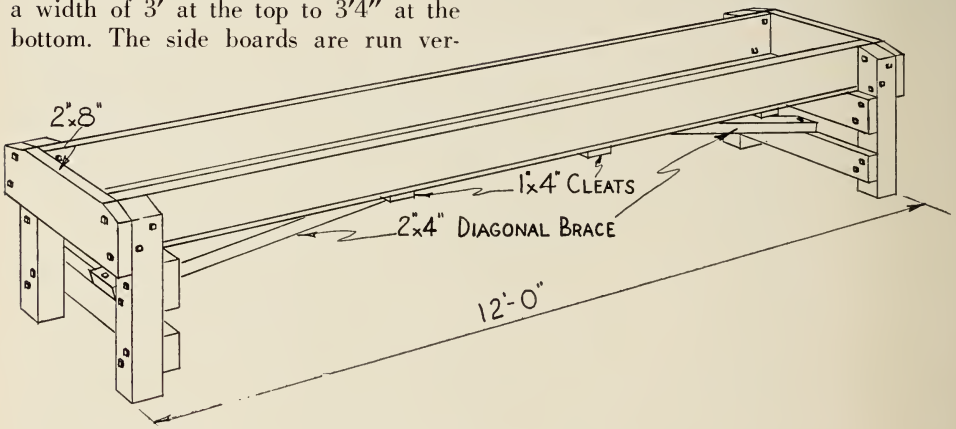
Manger cables 9″ apart; lowest is 40″ off ground.

tion with irrigated pastures. The feeder shown at top left of page 31 is suitable for feeding cottonseed meal salt mix on the range. It has a capacity of 9 cubic feet per foot of feeder, or about 360 lb. per foot, assuming feed weighing 40 lb. per cubic foot. A 10-foot feeder will hold 3,600 lb. of feed. Feeders of this type should be constructed to allow about 6 inches of space for each animal. Such feeders are usually placed about 1 mile apart on the range and *always near an ample supply of fresh water.*

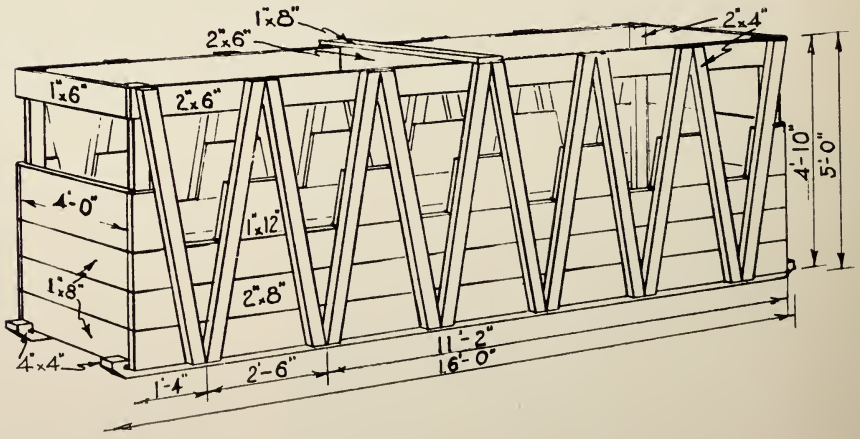


Cross section of a portable bunk.

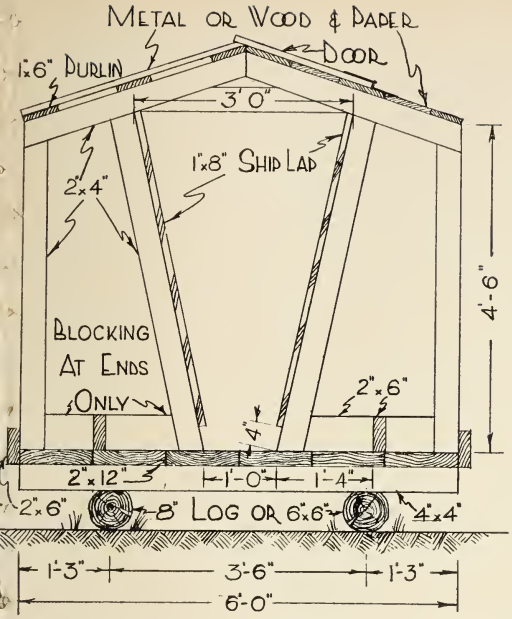
Self-feeding of chopped hay and grain mixtures requires that the sides of the feeder have a slight slope or "batter" to the outside. The sides slope outward from a width of 3′ at the top to 3′4″ at the bottom. The side boards are run ver-



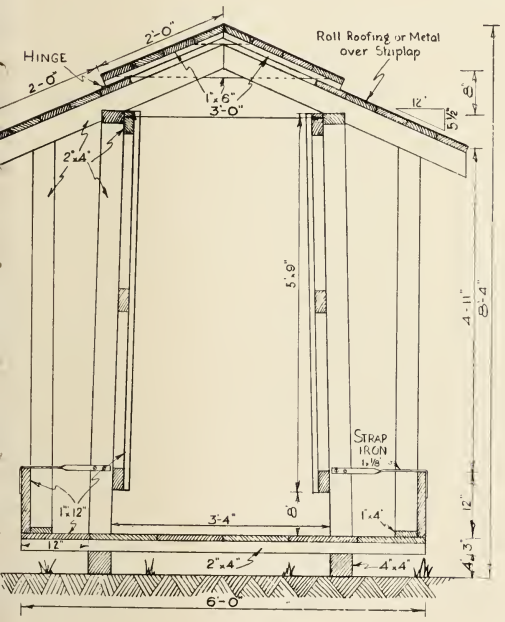
Isometric drawing of a portable bunk shown in cross section above.



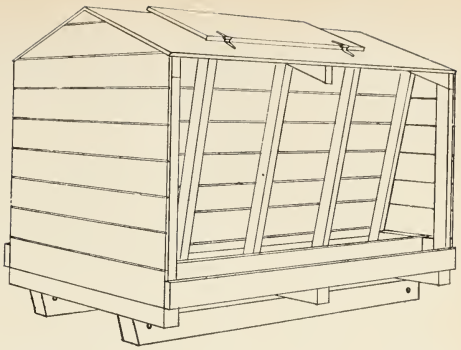
Portable hay rack, suitable for 12 animals. Capacity is about ⅔ ton of long hay.



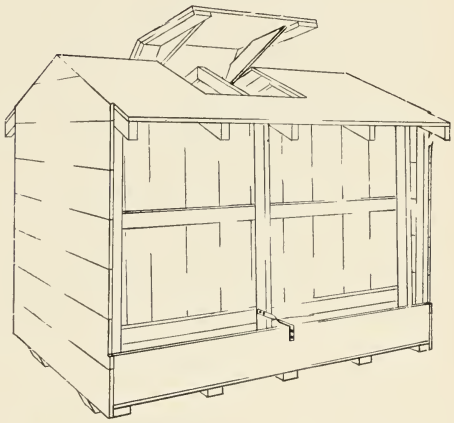
Cross section of a self-feeder for salt and cottonseed meal supplement. Skids provide portability.



Self-feeder for chopped hay and grain. Sides are 4 inches farther apart at bottom than at top, to prevent bridging.



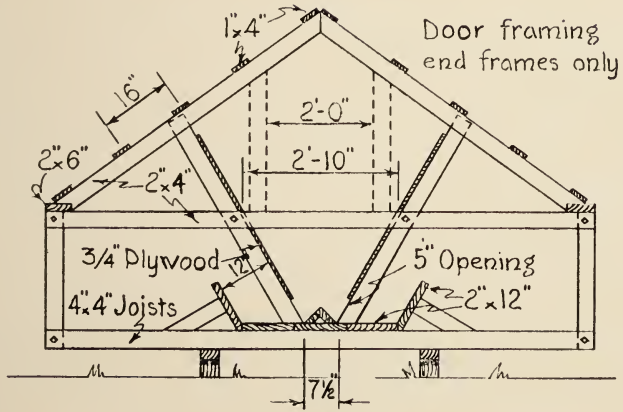
(Above) Sketch of self-feeder shown at top left, but with 6" x 6" skids instead of unfinished logs.



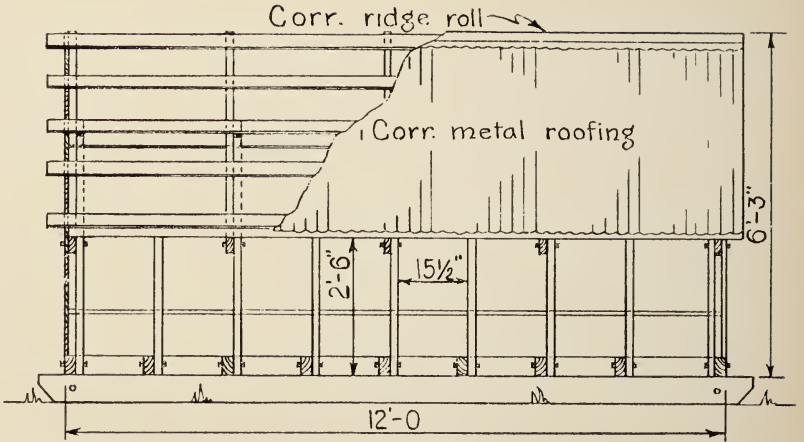
Perspective sketch of the self-feeder shown below at left.

tically so as to present a smooth surface to the hay. The capacity of this feeder is 18 cubic feet per foot of feeder, or (if the feed mixture weighs 10 lb. per cubic foot) 180 lb. per foot. A feeder 8 feet long will hold 1,400 lb. of hay and grain mixture. Allow 1 foot of space at this feeder for each animal.

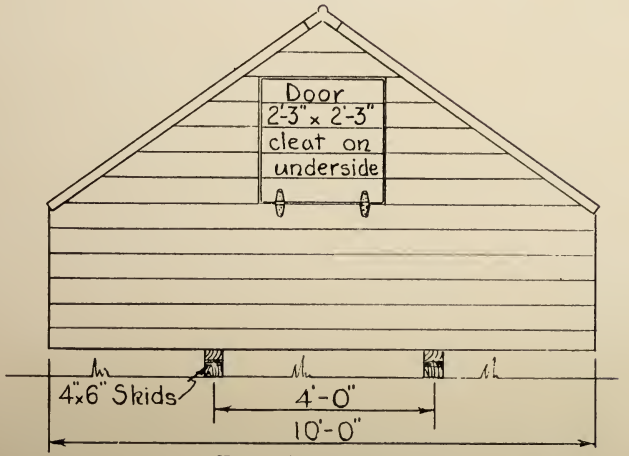
Self-feeders for creep-feeding calves are usually placed near the water or other places where cattle congregate. The type of feeder illustrated on page 32 does not require any fencing. Nursing calves are usually allowed access to creep-feeders when the feed supply is limited, or when such calves are to be fattened at an early age to be marketed (about 800 to 900 pounds).



FRAMING



SIDE ELEVATION



END ELEVATION

This self-feeding creep feeder for calves is mounted on skids. It is a complete unit, yet is readily portable. The bin holds about 1,000 pounds of feed concentrates.

MATERIALS FOR PLYWOOD BEEF CATTLE SELF-FEEDER (SEE PAGES 34–35)

PLYWOOD:

Pcs.	Size	Description	Use
2	4′ × 8′	⅜″ AC or BC EXTERIOR Douglas fir plywood	Roof.
2	4′ × 7′	⅜″ AC or BC EXTERIOR Douglas fir plywood	Sides.
2	4′ × 6′	⅜″ AC or BC EXTERIOR Douglas fir plywood	Ends.
1	4′ × 7′	½″ AC or BC EXTERIOR Douglas fir plywood	Floor.

LUMBER:

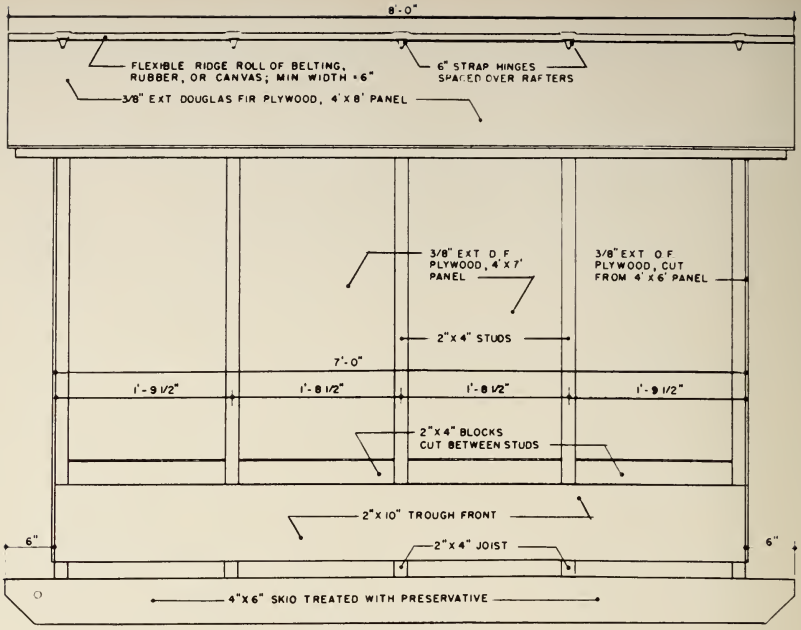
Pcs.	Size	Length	Description	Use
2	4″ × 6″	8′	No. 1 Com., D.F., S4S	Skids.
1	2″ × 10″	14′	″ ″ ″	Trough front.
1	2″ × 8″	6′	″ ″ ″	Gable cross ties.
1	2″ × 6″	7′	″ ″ ″	Ridge.
2	2″ × 4″	14′	″ ″ ″	Plates, blocking between studs.
3	2″ × 4″	12′	″ ″ ″	Joists, center cross tie.
7	2″ × 4″	10′	″ ″ ″	Studs.
4	2″ × 3″	14′	″ ″ ″	Rafters, blocking between rafters.
1	2″ × 3″	12′	″ ″ ″	1 rafter, 1 roof horizontal.
3	2″ × 3″	8′	″ ″ ″	Roof horizontals.
1	2″ × 3″	14′	″ ″ ″	Center ″V″.
1	2″ × 2″	8′	″ ″ ″	Trough front.
1	1″ × 12″	14′	″ ″ ″	Center ″V″.

HARDWARE:

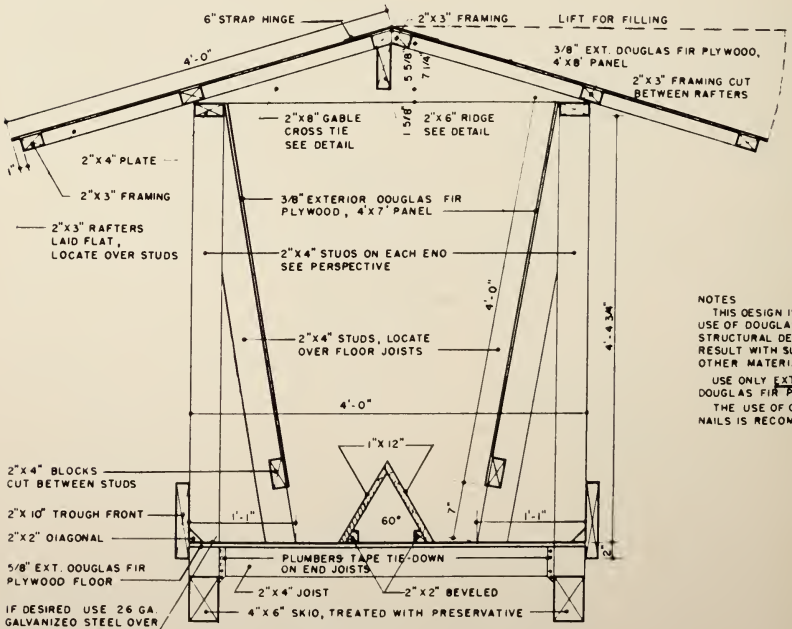
Pcs.	Size	Description	Use
1	32″	Plumbers tape	Tie down joists.
5	6″	Heavy strap hinges	Roof.
2	3″	Gate hooks	Roof.
1	8′ × 6″	Flexible ridge roll (belting, rubber)	Roof ridge.
5#	12d	Galvanized box nails	Framing.
5#	7d	Galvanized box nails	Plywood.
1#	5d	Galvanized box nails	Roof.

PAINT:

½ gal.	Outside primer.
½ gal.	Outside paint.
¼ gal.	Turpentine.
¼ gal.	Linseed Oil.



SIDE ELEVATION



SECTION LOOKING AT END FRAMING

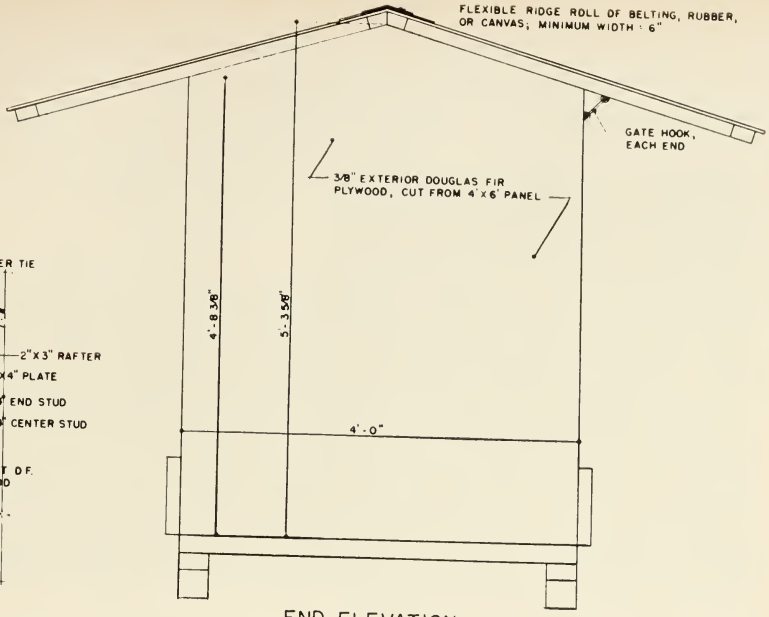
NOTES

THIS DESIGN IS BASED ON THE USE OF DOUGLAS FIR PLYWOOD. STRUCTURAL DEFICIENCIES MAY RESULT WITH SUBSTITUTION OF OTHER MATERIALS

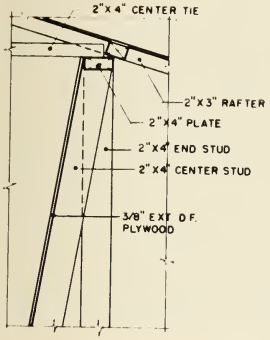
USE ONLY EXTERIOR TYPE DOUGLAS FIR PLYWOOD

THE USE OF GALVANIZED BOX NAILS IS RECOMMENDED.

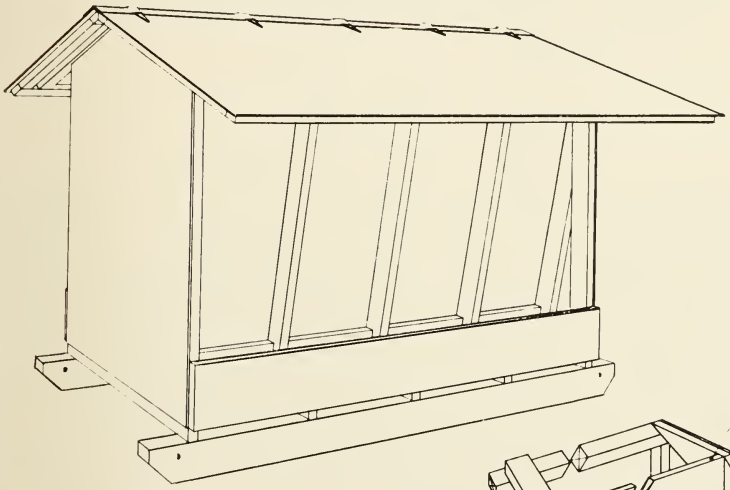
BEEF



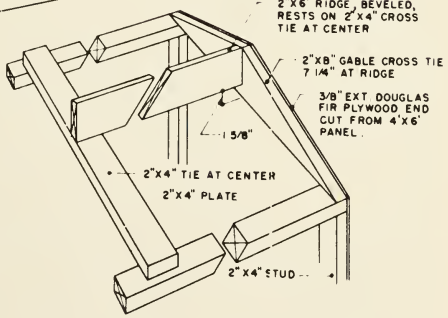
END ELEVATION



SECTION AT CENTER

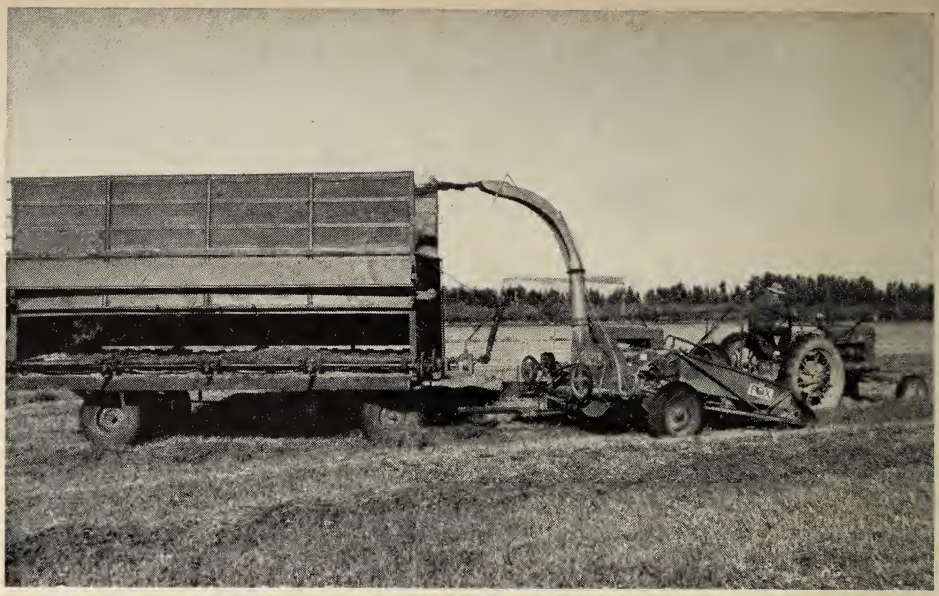


PERSPECTIVE OF FEEDER



PERSPECTIVE DETAIL

CATTLE SELF-FEEDER



Two efficient pieces of equipment for picking up chopped green material from the field (above), and distributing it to the feedyard (below). See text, page 28.

There are several ways to feed molasses

The use of molasses as a livestock feed is increasing. It is estimated that between 50 and 100 million gallons are fed annually to livestock. It is a very palatable feed, and contains about 70 per cent as much total digestible nutrients as does barley. During the past several years, molasses has been an economical feed compared with other concentrates of equal value. Because of its palatability it is especially valuable, when used on less palatable feeds, for inducing livestock to consume large quantities.

1. Open trough. Feeding molasses free choice in open troughs is quite a common practice. If the molasses drum can be placed in the trough with the plug out and the open hole down, it will serve as a self-feeder. To keep the cattle from smearing themselves with the feed, thereby wasting the molasses, some growers place a lightweight, slatted cover in the trough, which floats on the surface.

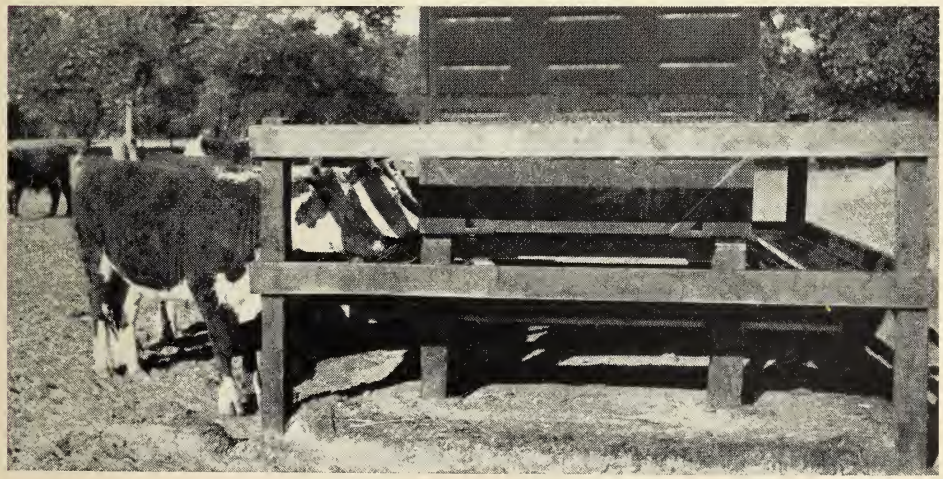
2. Pontoon tank. Another molasses self-feeder that has been found practical is a Navy pontoon tank. It is 5 feet wide, 7 feet long, and 7 feet high, and is supported on a platform approximately 30 inches from the ground. Small metal troughs, oval in shape and about 6 inches deep, are built on four sides of the tank. A 4-inch roller is constructed through the center of each trough. Baffleboards are placed from the edge of the trough to within about 1 inch of the roller.

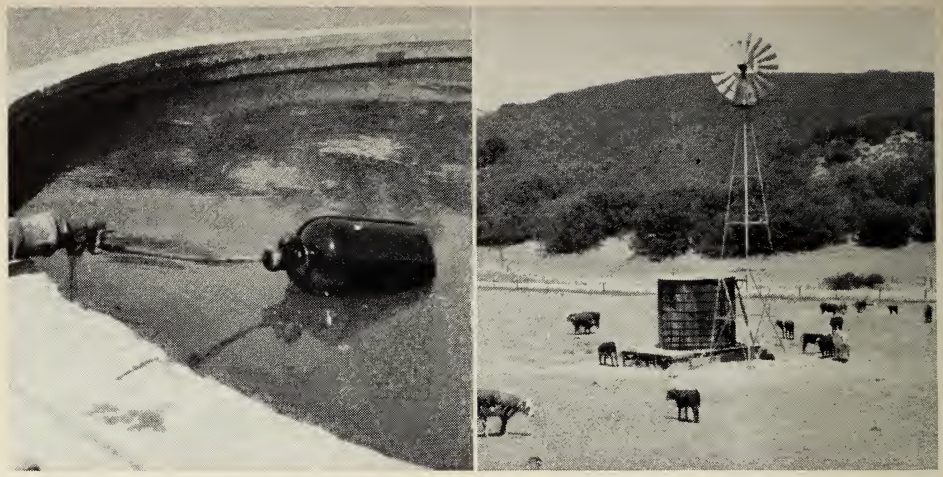
Molasses is supplied to the troughs through a float valve similar to that used in watering troughs, and cattle secure the molasses by licking the roller. This type of molasses self-feeder can be bought on the market or built on the ranch.

3. Sprayed on feed. Where small numbers of livestock are being fed molasses, it can be poured or sprayed on the feed. When molasses is fed in this way, it is diluted with water at the rate of about 1 gallon of water to 2 of molasses. Rigs used for spraying cattle or controlling weeds can be used for spraying molasses on the feed *if they have been thoroughly cleaned.* In some of the larger feedlots, special tanks placed on trucks and equipped with a spray boom are used for feeding molasses.

4. Mixed with feed. Probably the most common method of feeding molasses is to mix it with the feed. This re-

Molasses self-feeder constructed around a surplus Navy pontoon tank.





Concrete watering trough (left) with ranch-made float. Right: water storage tank and windmill using natural slope to fill trough.

quires more labor and equipment than do any of the other methods mentioned. It is best to use the molasses-mixed feed within a few days after mixing, since there is a tendency for feeds of this kind to cake when stored for any length of time. If such feeds are stored, they should be dry and should contain not more than 15 per cent molasses.

The most common type of continuous mixer consists of a large trough in which revolve one or two shafts carrying teeth, arms, or auger flights. Dry feed and molasses are poured into one end and are mixed as they pass along the trough and flow out the other end. Mixing can also be accomplished by running the molasses into the blower of a grinder or chopper or spraying it into the cyclone collector on the outlet of the grinder. A feed mix of more than 15 per cent molasses should never be attempted in hammer mills or blowers. Molasses viscosity may be reduced by adding water, but this should never be done if feed is to be stored for any length of time.

If over a pound of molasses per head per day is fed to cattle while they are grazing on lush green pasture, or when most of their roughage diet is composed of green-chopped feed, it may inhibit gain.

Providing drinking water

Good, clean, fresh water should be provided in feed corrals at all times. Place the trough so that it can serve at least two corrals. Good troughs are usually about 16 feet long and 3 feet wide. Oval-shaped bottoms are desirable for cleaning and draining the trough. Floats insure a continuous supply of water.

A float can be constructed of a 1-gallon glass jug attached to a commercial shut-off valve by means of a ⅛″ pipe. Threads to fit a ⅛″ pipe coupling are cut on the fulcrum of the valve base. The other end of the pipe (15–18″ long) is fastened to the jug with lock nuts.

Cattle on feed in most parts of California will drink between 10 and 12 gallons of water per head per day, but in hot interior valleys they may drink 15 gallons per head per day. If drinking water is kept to a temperature under 70°F cattle may gain more satisfactorily.

See your Farm Advisor for a plan for a 20-foot tower to support a 5,000-gallon circular tank.

Barns must be large enough, and the interior arrangements should be such that they can be cleaned easily. Beef cattle do not require a warm shelter, but it is desirable to protect them from cold rains, snow, and wind. Complete working plans for the construction of different types of feed and shelter barns are often available (see bottom of page 50).

The cross section of a barn shown on top of page 40 has a gable roof, the hay mow space down the center of the building being 24 feet wide and 20 feet high to the plates. A 6-foot feed alley (including manger) extends along each side of the hay storage the full length of the barn. Sheds 14 feet deep to the manger curb, with a low overhanging eave, closed ends, and sides entirely open, prevent rain being driven very far into the interior, and dry out readily.

The barn shown at center of page 40 is similar to the one shown above it except for the type of roof. The monitor-roof type brings the shed roofs a few feet lower and cuts down on the mow space above the cattle-shelter shed. The plans show wooden lock stanchions, but a V-opening feed rack may be substituted.

Chopped hay, being more "fluid" than long hay, exerts a greater pressure on the walls. The barn shown on the bottom of page 40 has sloping or "battered" sidewall posts along the mow, to relieve the walls of lateral pressure as the chopped hay settles. A small blower pipe opening in the peak of the gable substitutes for the usual hay doors.

The three barn plans just described all have open sheds on the sides for cattle shelter. They can be cleaned with mechanical equipment on tractors, but they have the disadvantage that the supporting posts on the outside must be worked around. A design for a feed and shelter barn with the shelter-shed roof cantilevered out from the side of the hay storage without supporting posts is shown on page 41.

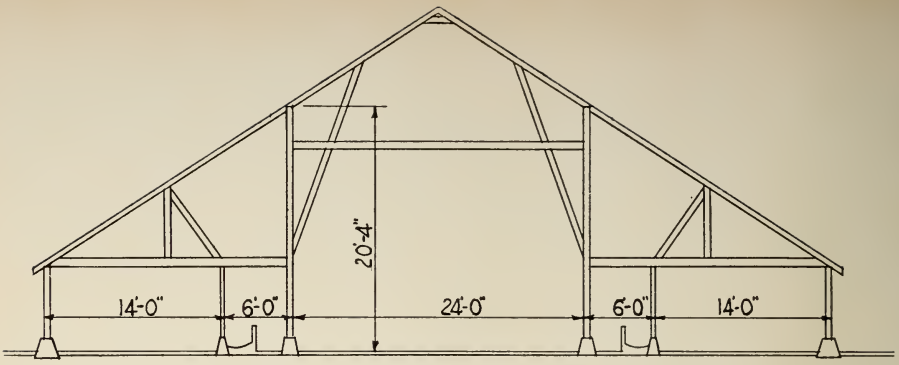
An area 12 feet wide outside the manger is paved with concrete. This allows animals to pass around behind those standing at the manger. Because of the absence of posts, the paved area can be scraped clean quickly with a blade on the front of a light tractor, and the 4-inch curb assures positive drainage to one or either end.

Cantilevered shelter sheds have the advantage of being easily cleaned, with no posts to interfere with equipment or injure cattle. Details of cantilever construction for chopped-hay barns are also shown on page 41. This type of roof is not recommended for areas with heavy snowfall because it is not designed to support a heavy load. For the same reason it is better to cover the shed with some type of metal roofing rather than heavier sheathing and shingles. Cantilever-type barns are increasing in popularity in California.

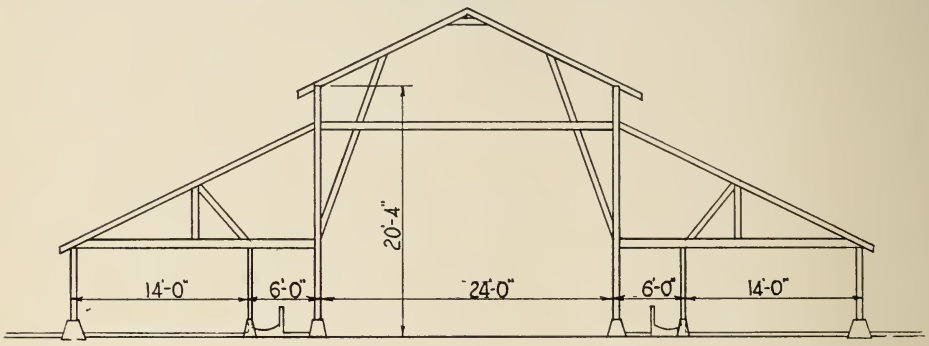
Capacities of Feed Barns

Before building, consider the amount of hay storage necessary to see the animals through the feeding period. The size of the barn will depend upon the number of animals, the months of the feeding period, amount fed per day, and density or weight per cubic foot of the hay. The latter will depend upon whether the hay is loose, baled, or chopped; how long it has been in storage; and what the depth is.

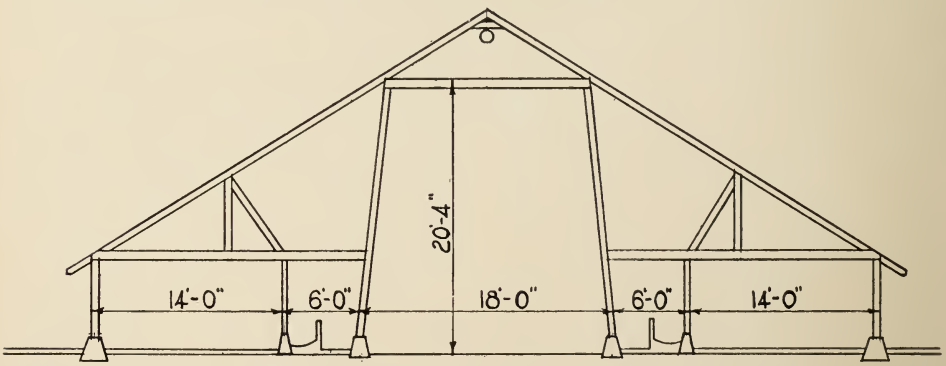
The table on page 40 gives the capacity *per foot of barn length*, for long, baled, and chopped hay of each of the four barn plans just discussed. An average figure for the density of loose hay has been considered as 4 lbs. per cubic foot, for baled hay as 10 lbs., and for chopped hay as 12 lbs. (500, 200, and 170 cu. ft. per ton, respectively).



Gable-roof barn showing hay storage manger locations.



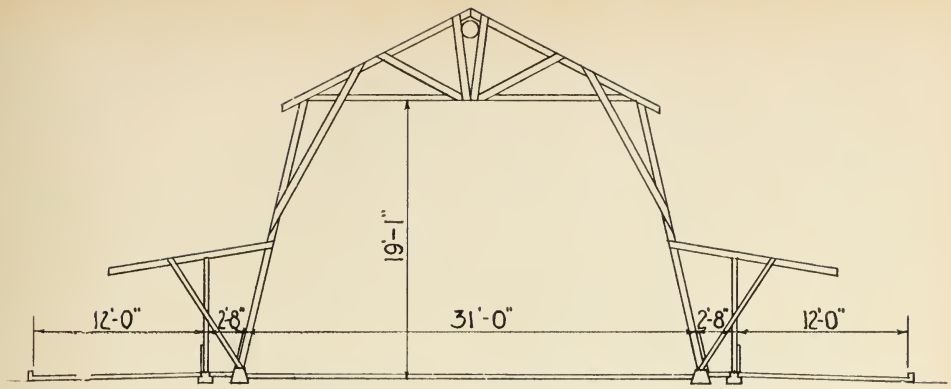
Feed and shelter barn with monitor roof.



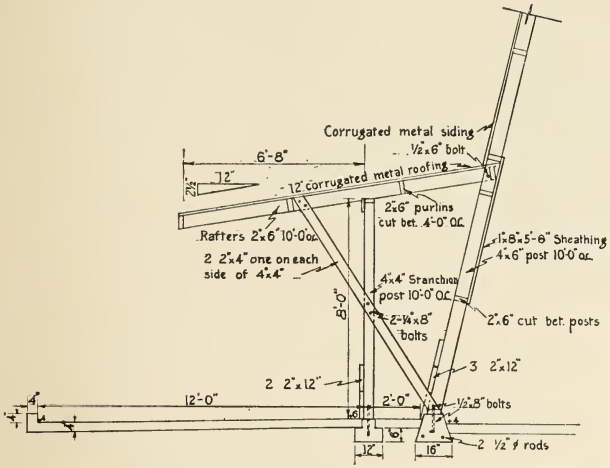
A feed and shelter barn especially designed for chopped hay. Sloping the side posts along mow relieves them of pressure when the hay settles. Capacity (ton/foot of barn length) is: long hay, 0.7; baled hay, 1.5; and chopped hay, 1.9.

Capacity per Foot of Barn Length

	U.C. Barn Plan No.		
	136	137	225
Volume (cu. ft./foot of barn length)	480	480	512
Capacity (ton/foot of barn length)			
Long hay	1.0	1.0	1.0
Baled hay	2.5	2.5	2.5
Chopped hay	2.8	2.8	3.0



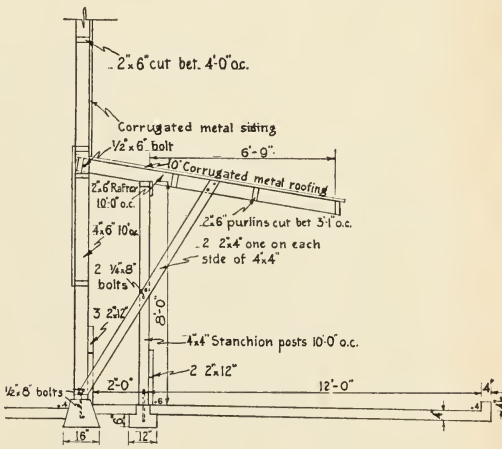
Feed and shelter barn for chopped hay having cantilever shelter shed with no supporting posts.

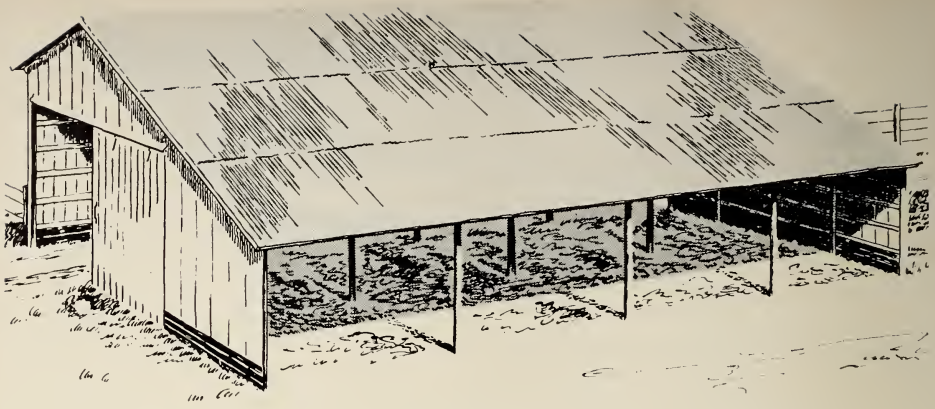


Details of cantilever construction for chopped-hay barns.

Two and one-half feet of manger per animal is usually considered enough for dehorned beef cattle. Thus, with shelter barns and mangers on either side of the feed barns, each two animals will have in front of them 2½ feet of hay storage, or 1¼ foot per animal.

The capacities given above for hay, divided by the daily amount fed per animal, and multiplied by 1¼, will give directly the number of days' feed that can be stored. For instance, if 30 lbs. per day is fed per animal, the plan shown in the middle of page 40 will hold 158 days' feed when chopped hay is fed, $\frac{2.8 \times 2{,}000 \times 1.25)}{30}$, and only 58 days if long hay is stored, $\frac{1.0 \times 2{,}000 \times 1.25)}{30}$.





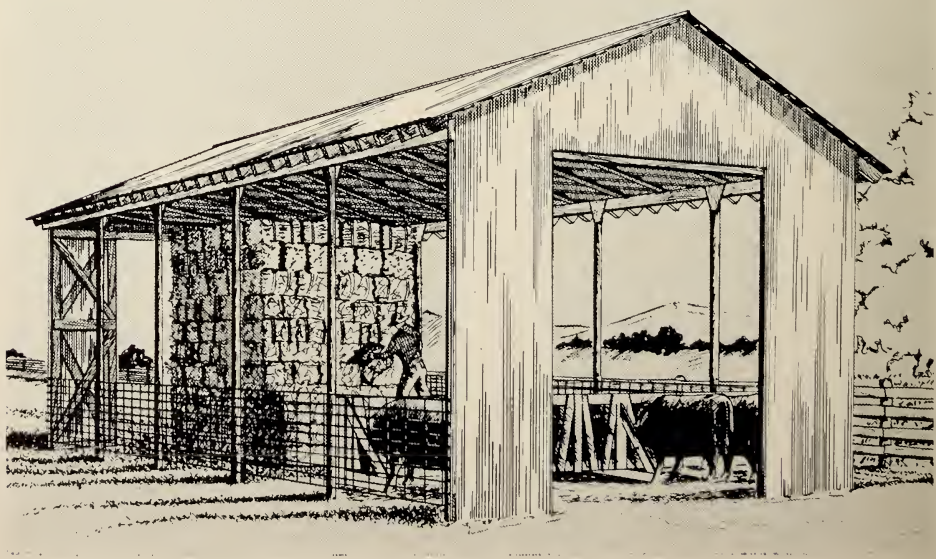
Pole barn construction. (Plan 5831, courtesy USDA and cooperating states.)

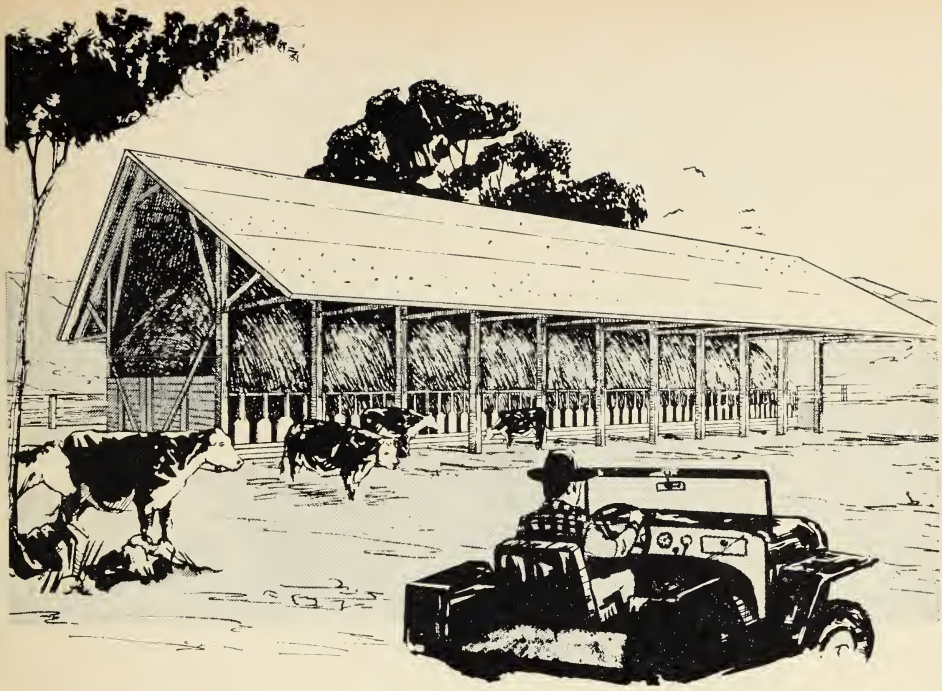
Pole buildings are easily constructed and are very satisfactory if properly designed. The building shown above is 39 feet wide and 60 feet long, but it could also be 26 or 52 feet wide and the length varied in units of 15 feet.

The building for self-feeding of baled hay (see below) can be lengthened by units of 12 feet, each 12-foot section having a capacity of 15 to 30 tons (depending upon the tightness of the bales). The end walls are well braced, and siding and doors can be added if desired. The self-feeding feature consists of a stanchion line which the cattle may push forward as the hay pile decreases in size. It is necessary for the bales to be taken apart manually.

An open hay storage building is shown at top of page 43. This building can be used for storing chopped or baled hay or for feeding, or for storing machinery or

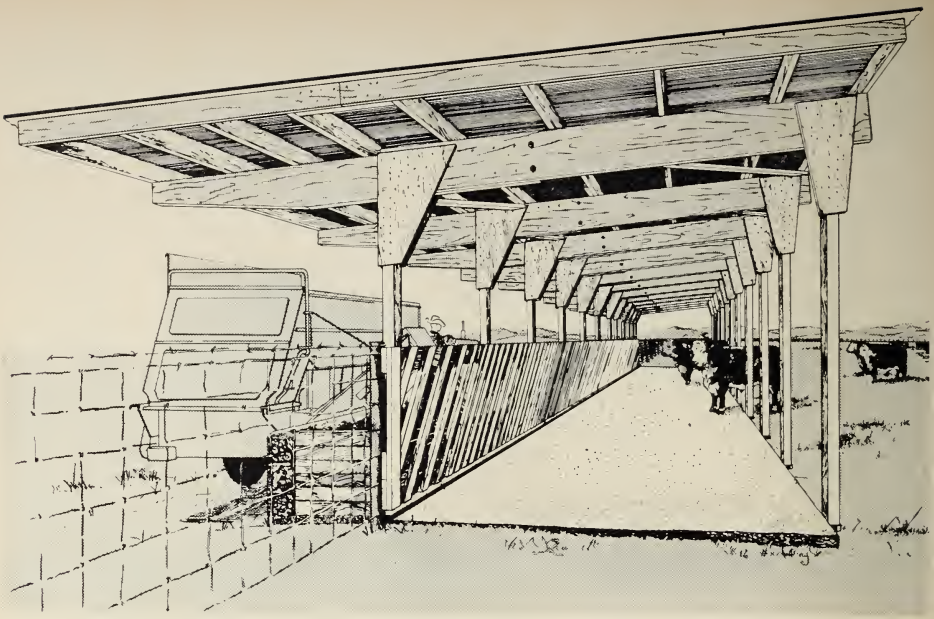
Hay shed for self-feeding. (Plan 5847, courtesy USDA and cooperating states.)





Open hay storage building. (Plan 5879, courtesy USDA and cooperating states.)

Hay and storage and feeding shed. (Plan 5935, courtesy USDA and cooperating states.)



Fence-line feeder for cattle. (Plan 5854, courtesy USDA and cooperating states.)

sheltering livestock. For self-feeding hay to cattle, it will accommodate about 16 head in each bay (a length of 8 feet). Air ducts on the floor of the center portion, and an overhead conveyor for hay, are needed to convert the building to mechanized hay-drying and handling. It is best to have no posts along the sides if a tractor-powered cleaning blade is used. As with all pole-type buildings, lumber in contact with soil must be treated with wood preservative.

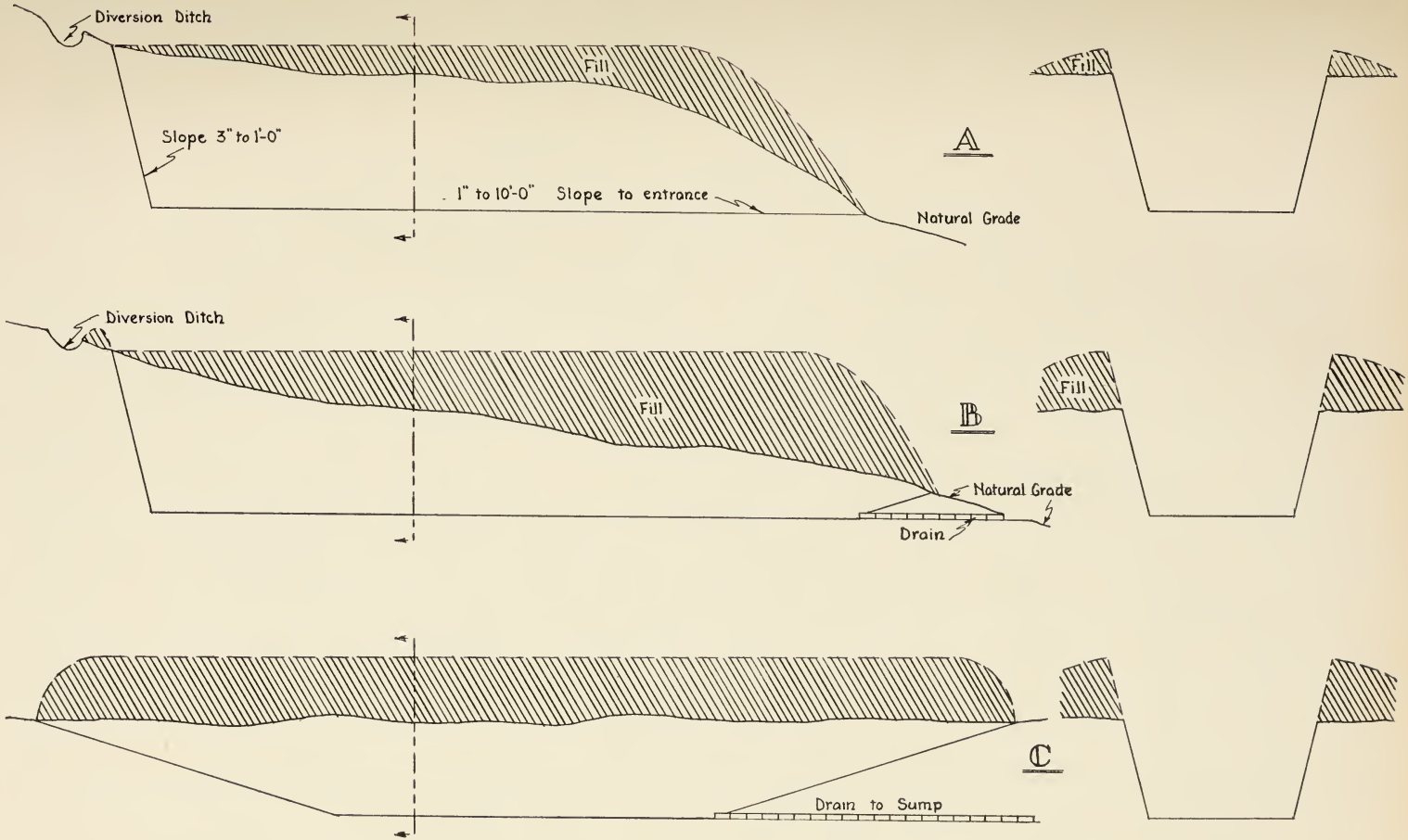
Another pole-type hay storage and feeding shed is also shown on page 43. This is easily adapted to various beef-management systems. Feed mangers 30 inches wide are protected by roofs 10 feet wide cantilevered on each side of the 26-foot-wide hay storage area. Capacity for baled hay per foot of length varies from 1.25 tons for a 12-foot height, to 1.9 tons for an 18-foot height.

The sketch above shows a fence-line feeder to be filled with a self-unloading truck or trailer. A lightweight metal roof protects the concrete manger and platform from sun and rain. The wood framing is supported by pressure-treated poles, or square posts, spaced 10 feet apart center to center lengthwise of the platform.

A well-drained trench silo

With the introduction of better varieties of corn and of various other silage plants, the use of silage is each year becoming more popular in California. Hay can be replaced by silage at the ratio of 3 lb. of silage to 1 lb. of hay. Recent tests indicate that cattle can be successfully fattened with silage as the sole source of roughage.

Trench silos provide economical storage for the feeder if suitable precautions for drainage are taken and the silage is adequately packed while trenches are being filled. This type of silo is well adapted to the use of a field harvester, since the trucks of cut feed can be emptied by false bottoms or by cables hitched to a post in the ground. A blower is not needed at the trench. A trailer of the type shown on page 36 can be used for this purpose.



Three arrangements of trench silos: A. on a hillside; B. on a gentle slope; C. on level ground.

Dig the silo on the side of a hill if possible. Ditches should be placed in the hill above the silo to divert surface water. Some users construct a tile line down the center of the trench bottom to carry away surplus juices to a dry well, open drainage ditch, or sump.

In the sketches on page 45, three general layouts for trench silos are shown, including the three most usual conditions of grade slope. The sides should be sloped inward from 3 to 5 inches per foot of depth ("Farm Silos," publication 810, miscellaneous publications, Oct. 1964, ARS, USDA, Washington, D.C. 20250).

Corn silage, if well packed, will weigh between 30 and 40 lbs. per cubic foot, 35 lbs. usually being assumed. If the ground-water level will allow a depth of 10 feet, a capacity of 1½ tons per foot of trench may be obtained with a top width of 11 feet, bottom width of 6 feet, and side slope inward of 3 inches per foot. However, some locations may not allow such a depth because of a higher water table, and some soils may not stand up at this slope. Each location and condition presents its own problems.

In general, the bottom of the trench should slope about 1 inch per 5 feet toward the outlet (if on a hillside) or toward the inlet to the drain tile. If more convenient, the drain can be placed in the center of the trench. When natural drainage is not available, the tile may be emptied into a sump and be pumped out to a surface-drainage ditch. The earth removed from the trench may be banked up beside the silo to form part of the walls. It should be packed well before filling and, to allow for complete settlement, should not be lined until the second year. Either concrete or wood may be used for lining if desired, although trenches have been used for years in some areas with only a scraping down of the earth walls before filling each year.

A cement plaster, 2 or 3 inches thick, makes a good lining for firm soil. Apply a plaster of 1 part cement, 3 parts sand, and 3 parts pea gravel, over wire mesh held to the wall with spikes. Planks set vertically may also be used. Horizontal nailing rails of 4″ x 4″'s should be let into the sides of the trench, about 4 feet apart. A larger timber would be better for the upper plate.

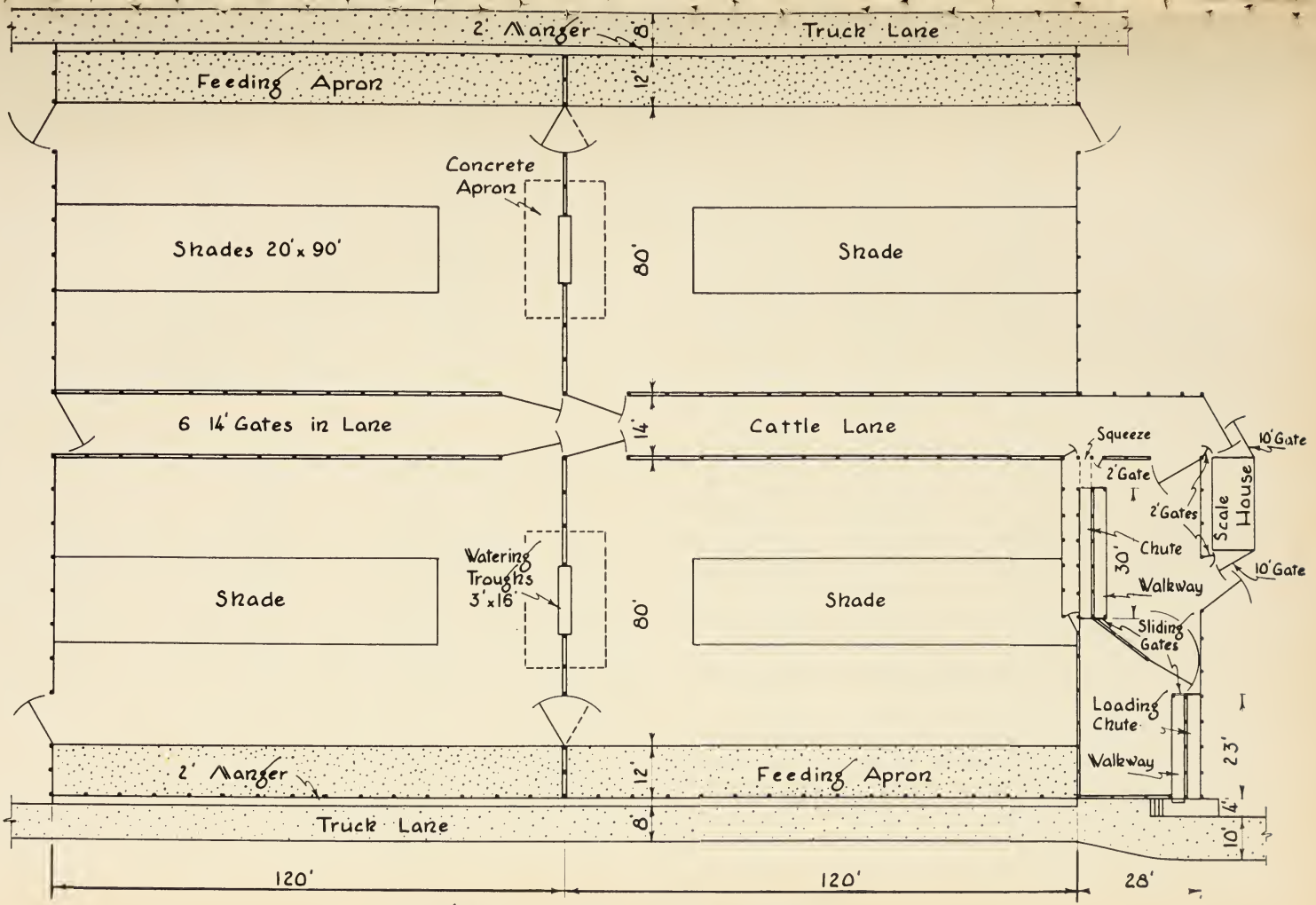
Roofs are not generally necessary for trench silos in California. Good practice is to fill the silo 3 or 4 feet above the top of the trench, pack each load with a tractor, allow to settle overnight, and then refill to the same level with more silage. The silage can then be overlaid with heavy kraft paper and covered with several inches of earth to keep out air. Some feeders cover the silage with several inches of straw, chaff, or other material, wet it down, and seed barley. The roots of the sprouted barley make a firm and fairly air-tight cover.

If a truck is going to be used for emptying the silo, it should be recognized that the bottom of the trench may be very muddy. It may be more convenient to lay down planks or other surfacing material on the trench bottom before filling rather than during emptying.

Aboveground silos

Aboveground bunker or trough silos are popular in California. They are especially suitable for saving labor in feeding. They may be constructed of concrete or wooden walls. A concrete floor is advisable. One advantage of aboveground trough, bunker, or horizontal silos is that they may easily be made self-feeding. (To obtain plan, see page 50.)

Plan for a four-pen feedlot. This will accommodate about 200 head of cattle at 50 head per pen. Each animal will have 2½ feet of manger. Pens might be added at left to increase the lot's capacity if desired. See pages 48–49 for estimated costs.



All gates 12'-0" unless otherwise dimensioned.

ESTIMATING COSTS OF FEEDLOTS

A small, four-pen feedlot, suitable for about 200 head of cattle, is shown on page 47. At 50 head per pen, each animal will have about 220 sq. ft. of corral space. If shade is required, the sketch shows an allowance of 36 sq. ft. per animal. Shades should be at least 10 feet high for greatest cooling effect, and preferably oriented east-west. However, in wet areas, greater drying effect will be obtained if the shades run north-south.

Each animal is allowed 2½ feet of manger. The area back of the manger is paved for a distance of 12 feet. The feed truck lane is also paved. One water trough, mounted on a concrete platform, serves two pens. Gates 14 feet wide, between the pens, enable manure-cleaning equipment, such as bulldozers, elevators, and trucks, to be easily maneuvered without going through the cattle lane. The work corral, with branding chute, squeeze, scale, and loading chute, is located so that animals can be brought in from any pen, sorted, weighed, loaded, or otherwise handled. The capacity of this feedlot can be expanded by increasing the number of pens.

Prices of material for building feedlots will vary with location and specifications.

ESTIMATED MATERIALS AND COSTS FOR FOUR PENS ON PAGE 47

Figures do not include work corral, scales, shades, water pipe and well. Assume pen fences of four Douglas fir 2" x 6"'s bolted to 6" x 6" redwood or treated posts. IMPORTANT: rising material and labor costs, and local variations in prices, should be considered in making all estimates.

Concrete:

MATERIALS		COSTS
Truck lane, 8' × 480', 6" thick... 71 cu. yd.		
Paved manger bottom and standing platform, 14' × 480', 4" thick.. 83 cu. yd.		
2 tank platforms, 19' × 32', 6" thick ..... 23 cu. yd.		
Total.....177 cu. yd.	Ready-mix concrete @ $16 per cu. yd.	$2,832.00
Labor and material for forms, placing and finishing concrete, estimated at 25 per cent of cost of materials if ranch labor is used		619.50
	Total cost for concrete work.....	$3,451.50

Feed Corral and Mangers:

172 posts, 6" × 6" × 8'	@ $2 each	$ 344.00
Corral fence: four 2" × 6"'s (double on partition fences), and about 412 2" × 6" × 16', or 6,592 bd. ft.	@ $120 per M	791.00
Manger: 480 lineal ft.	@ about $1 per lineal ft....	480.00
Five 12' gates	@ $35 each	175.00
Six 14' gates	@ $40 each	240.00
	Total cost of fence materials.....	$2,030.00
Labor, 50 per cent of cost of materials, using ranch labor		1,015.00
	Total cost, fences, mangers, gates, etc.....	$3,045.00

Costs continued on next page

Hardware:

2 water tanks, 3′ × 16′	@ $150 each	$ 300.00
Bolts for fence:		
300 machine, ½″ × 8″	@ 10 cents	30.00
224 machine, ½″ × 10″	@ 12 cents	26.88
1,050 plate washers for bolts, 4″ × 4″ × 3/16″ thick	@ 4 cents	42.00
	Total for hardware	$ 398.88

TOTAL COST OF FEEDLOT CORRAL $6,895.38

The total cost of the feedlot corral is $6,895.38. The average cost per head is about $35. Feed mill, well, and piping are not included in this total cost. Costs of work corral and equipment are estimated below.

ESTIMATED MATERIALS AND COSTS FOR WORK CORRAL PLANS ON PAGE 47

MATERIALS FOR BRANDING CHUTE AND SQUEEZE		COSTS
Posts:		
14 posts 8′ long		
6 posts 10′ long	@ 25 cents per lineal foot	$ 45.00
Lumber:		
2″ × 4″, 60 lineal ft.		
2″ × 6″, 396 lineal ft.		
2″ × 8″, 120 lineal ft.		
2″ × 10″, 60 lineal ft.		
18 1″ × 6″'s 8 ft. long (gates)	@ $120 per M bd. ft.	92.00
Hardware:		
4 lbs. 10d nails	@ 15 cents lb.	.60
12 lbs. 30d nails	@ 15 cents lb.	1.80
Miscellaneous (pipe, steel, etc.)		12.00
¾ cu. yd. concrete	@ $14 per cu.yd.	10.50
Commercial cattle squeeze		400.00
	Total for materials	$ 561.90

MATERIALS FOR LOADING CHUTE		COSTS
Posts:		
13 posts 12′ long		
4 posts 10′ long		
4 posts 8′ long	@ 25 cents per lineal foot	$ 60.00
Lumber:		
1″ × 6″, 192 lineal ft.		
2″ × 6″, 1,026 lineal ft.		
2″ × 8″, 160 lineal ft.		
2″ × 12″, 160 lineal ft.	@ $120 per M bd. ft.	198.50

Costs continued on next page

Hardware:

52 machine bolts, ½" × 10"	@ 15 cents	7.80
96 machine bolts, ¼" × 3½"	@ 4 cents	3.84
Washers for above		2.00
35 lbs. 30d nails	@ 15 cents lb.	5.25
Miscellaneous hardware and steel		20.00
	Total for materials	$ 297.39

MATERIALS FOR WORK CORRAL FENCE		COSTS
15 posts 8′ long		
4 posts 10′ long	@ 25 cents per lineal ft.	$ 40.00
64 2" × 6"'s, 16 ft. long	@ $120 per M	122.90
Four 12-ft. gates	@ $35	140.00
Two 10-ft. gates	@ $30	60.00
Five 2-ft. gates	@ $5	25.00
	Total for materials	$ 387.90
Scale, 8′ × 20′ (without scale house)		$ 700.00
Labor, estimated at 50 per cent of cost of materials (less commercial squeeze and scale)		$ 423.60

TOTAL COST OF WORK CORRAL $2,370.79

NOTE: This equipment will handle a much larger feedlot than the four pens shown on the plan. However, all the equipment shown is needed for efficient operation of even a small feedlot.

Your local Farm Advisor can supply you with the University of California Agricultural Experiment Station publication "List of Farm Structure Plans" which gives the number and price of some of the plans discussed in this circular. Or you may obtain the list by writing to:

Agricultural Publications
University Hall
University of California
Berkeley, California 94720

For a list of available USDA farm structure plans see your Farm Advisor, or write to:

Department of Agricultural Engineering
Oregon State University
Corvallis, Oregon 97331

TIPS ON HANDLING CATTLE

Follow these suggestions and prevent costly bruises:

Dehorn cattle, preferably when young, or use a polled bull.

Remove projecting nails, splinters, and broken boards from feed racks and fences.

Keep old machinery, trash, and any obstacles that may cause bruises out of feedlots.

Do not feed large amounts of grain to cattle just before loading.

In hot weather, get stock away early to avoid extreme temperatures.

Use good loading chutes, not too steep.

Bed with sand free of stones to prevent slipping during shipment.

Cover sand with straw in cold weather.

Provide covers for trucks to protect cattle from sun in summer and cold in winter.

Always partition mixed loads to separate classes of livestock.

Remove protruding nails, bolts, or any sharp objects from trucks or cars.

Load cattle slowly to prevent crowding against corners and to avoid excitement.

Do not overload.

Use canvas slappers instead of clubs or canes.

Tie all bulls in trucks or cars.

Inspect load en route to prevent "downer" cattle.

Back truck slowly and squarely against unloading docks.

Drive carefully. Slow down on sharp turns and avoid sudden stops.

Unload slowly. Use cleated inclines.

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Some details of plans discussed in this publication may not meet all provisions of all local building codes. Therefore, it is advisable to check plans with your city or county authorities.

To simplify the information, it is sometimes necessary to use trade names of products or equipment. No endorsement of named products is intended nor is criticism implied of similar products not mentioned.

CONTENTS

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