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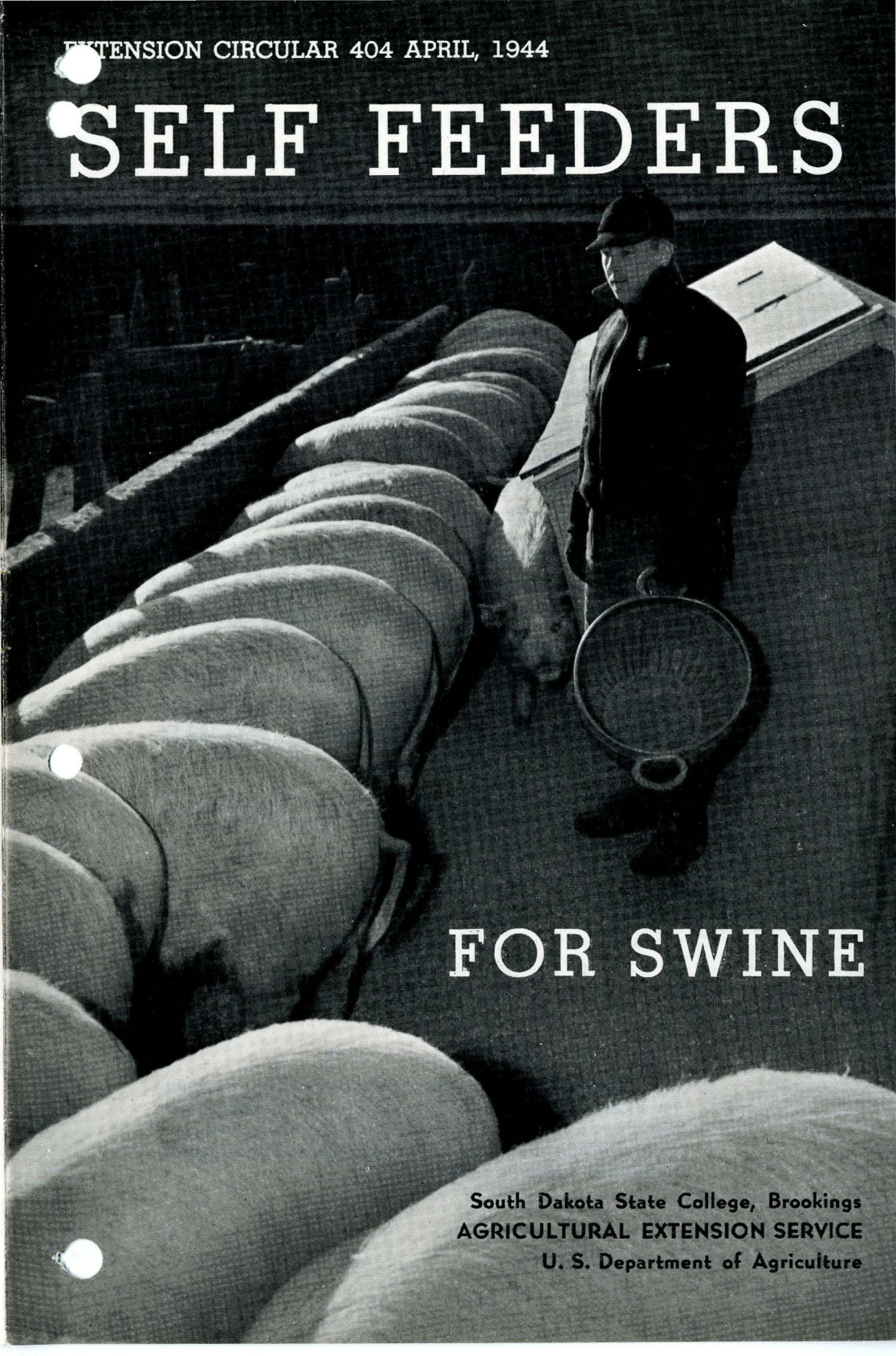
Self Feeders for Swine

Ralph L. Patty

EXTENSION CIRCULAR 404 APRIL, 1944

SELF FEEDERS



FOR SWINE

South Dakota State College, Brookings
AGRICULTURAL EXTENSION SERVICE
U. S. Department of Agriculture

Self Feeders For Swine

By Ralph L. Patty*

The trend of modern methods of farming requires more time-saving machinery and equipment. This is particularly true of equipment for hog production. There is an ever increasing demand for better and time saving equipment in hog production. It was this demand for new ideas and plans for such equipment that led to the preparation of this circular.

Plans in blueprint form are available from the Agricultural Extension Service for equipment shown in this circular when so stated at the end of the description. Please order by number. Most of these same plans will also be found listed in Extension Circular 323 which contains a list of all the plans and printed circulars having to do with building that are available at this time.

Head, Department of Agricultural Engineering. Mr. Patty prepared this publication at the request of the Agricultural Extension Service.

ON THE COVER: This concrete hog feeding floor was built on a Clay county farm in 1915 and has seen continuous service since. It is still in good condition. It has a three-foot concrete wall built around the outside edge. The self-feeder stands on the floor inside the walls.

The South Dakota "Walk-In" Self Feeder for Hogs

PLAN NO. 5215

A new idea in feeders is shown in the plan on the two following pages.

This feeder is 12 x 16 feet with a storage capacity of 440 bushels of feed, which includes the 90 bushels the feeder itself holds. The work alley provides shoveling space for refilling and servicing the feeder as well as for mixing feeds and emergency storage. The lumber bill is approximately the same (no more) as for a 500 bushel granary.

The design of this refill feeder was suggested by the demand for large capacity feeders. The lumber for building it, with the average lumber cost at $55 per thousand board feet would be $136.70, including the shingles. This cost is not so unreasonable when the 440 bushel grain storage capacity is figured. The bill of lumber required for this bin-feeder was compared with the bill of lumber for a conventional 500 bushel granary and the cost of the materials for the bin-feeder was slightly less than that of the 500 bushel granary. The feeder itself holds 90 bushels of grain and the bins hold 350 bushels when level full, making a total capacity of 440 bushels.

The advantages of the feeder in addition to its grain storage capacity are many. The feeder part is readily accessible for servicing at any time, including stormy weather and while the pigs are feeding. Full loads can be hauled to it in large trucks. Feeds can be readily mixed in the work alley. The end bin next to the door can be used for protein and mineral feeds which might be handled in sacks. Partitions can be rearranged in the feeder part to suit the operator for these feeds. The hinged agitator is simple and

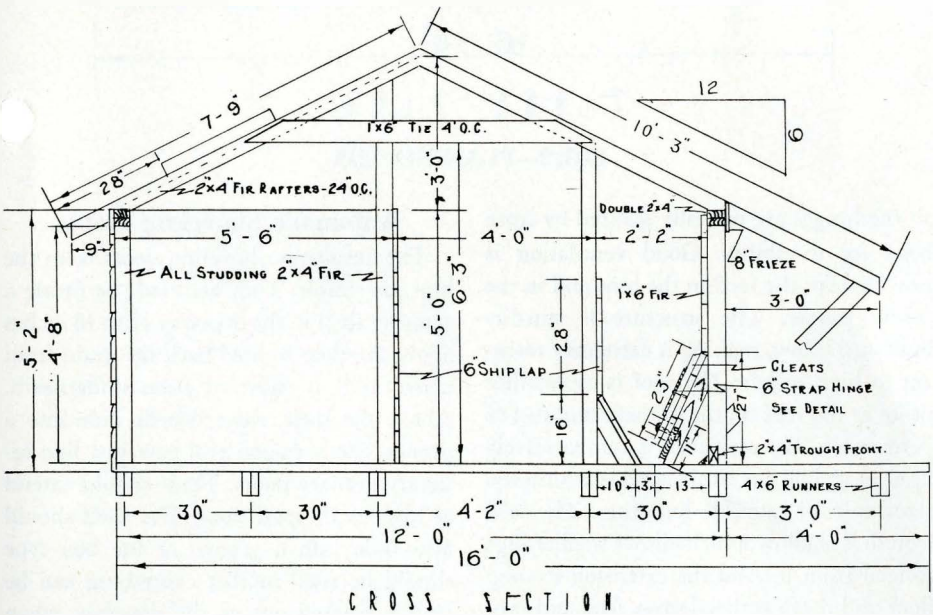


FIG. 1—PLAN NO. 5215

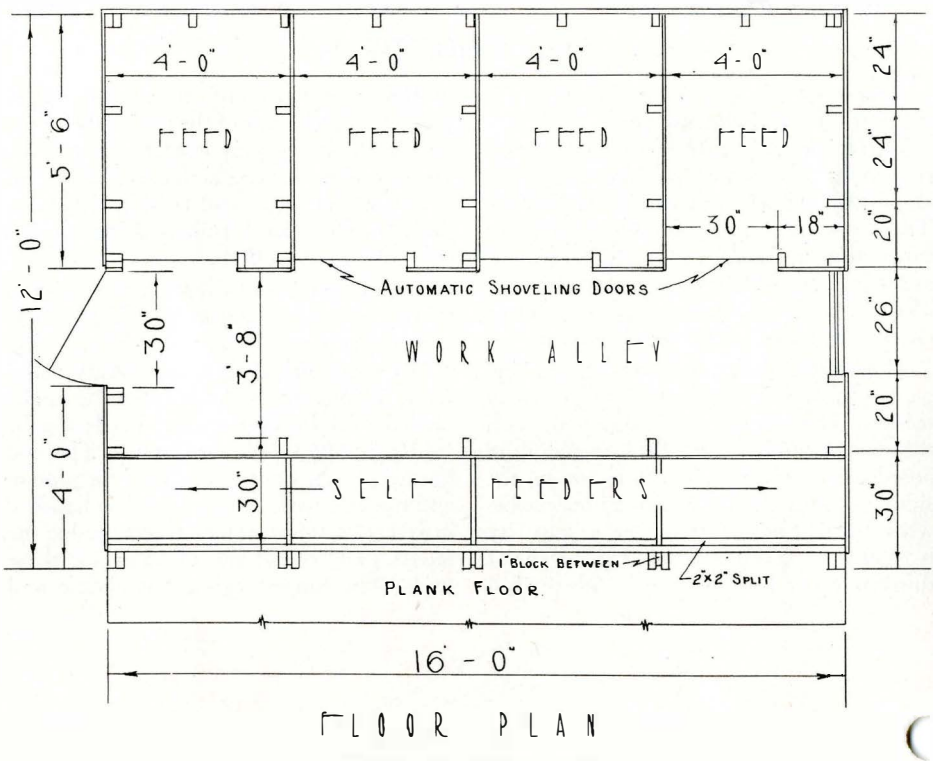


FIG. 2—PLAN NO. 5215

all the hinges are partially secured by stove bolts for durability. Good ventilation is provided for the feed in the bins and in the feeder proper. The structure is sturdily built and is low, making it extremely resistant to high winds. The roof is as weather proof as the roof on the granary and just as permanent. The structure is comparatively light in weight for its size and is within the size limit for movable buildings. The feed trough is shallow which allows smaller pigs to feed from it. And the extension feeding floor and roof overhead saves feed and protect the hogs from sun and rain.

Automatic Shoveling Doors

The automatic shoveling doors from the bins are simple. They are made by fitting a slanting shelf in the doorway 12 to 18 inches above the floor to hold back the grain from above as it is shoveled from underneath. Above the shelf, short boards slide into a groove like a wagon end gate just like ordinary granary doors. These should extend as high as the partitions. The shelf should also slide into a groove or the box type should be used so that everything can be readily cleared out of the doorway when desired.

A box-like structure with the wide shelf for its top is shown on the blueprint for an automatic shoveling door. When fitted snugly into the doorway at the bottom from the inside and against cleats it may be loose and is readily slid out of place when the grain that was against it has been fed out.

The Shoveling Hatches in the Roof

A small detail of the shoveling hatches is shown on the blueprint plan. The hatch is boxed in with 2 x 6 lumber which sets on the top of the rafters. This brings the top about five inches above the roof sheeting. Metal flashing strips around the edge and under the shingles make them rain proof. The lid for the hatch has 2 x 4 lumber around the edge with shiplap over the top, and covered with sheet metal. The lid should fit snugly and will need no hinges or other fastening.

Other Features

The two top boards on the side of the feeder proper are nailed solid, while the two bottom boards are hinged to swing in, and are fitted with spike nails. This makes a simple agitator for loosening ground feed so it will feed down. This has proven better than to hinge the entire side of four boards because the two lower boards do not carry so much weight and the pigs can move them more readily.

The window shown at the right end of the work alley and the open top of the divided door provide good ventilation for ground feed and grain from the thresher. The screen is suggested over the window to keep out birds.

The material required for building the "walk-in" feeder is listed on the blueprint. The total lumber required is 2070 board feet. The blueprint plan is more complete and costs 20 cents. It is plan No. 5215.

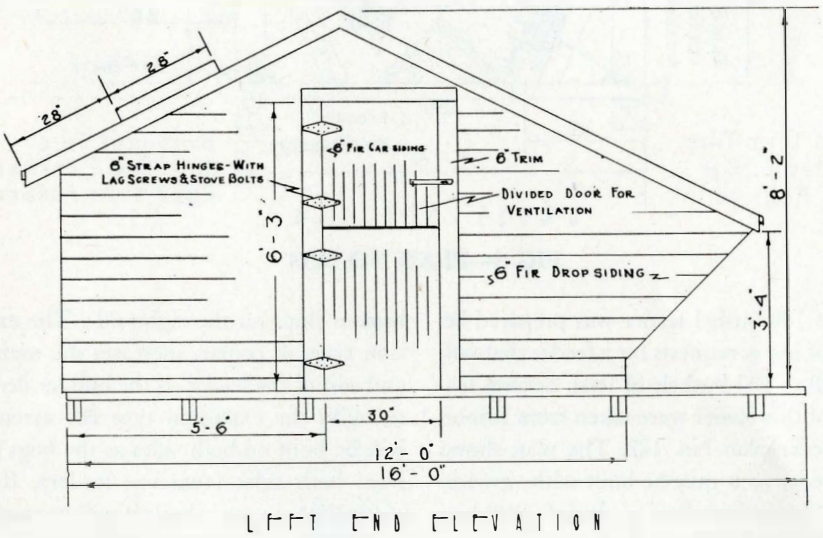


FIG. 3—PLAN NO. 5215

The 100 Bushel Feeder

PLAN NO. 5214

This feeder is 8 ft. long by 4½ ft. wide and may be built with or without the extension feeding platforms and roof as the builder desires. In order to simplify the drawings, the plan shows the conventional feeder on the left of the center line in Fig. 4, and the extension roof feeder on the right.

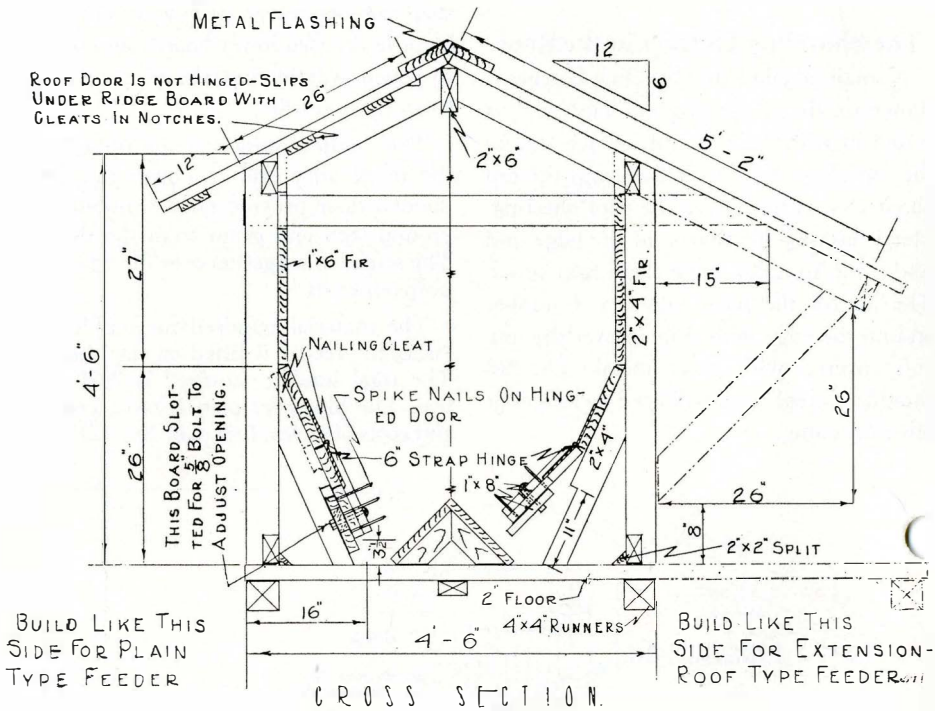


FIG. 4—PLAN NO. 5214

This 100 bushel feeder was prepared because of many requests for a feeder that will hold 80 to 100 bushels of feed. Several features of this feeder were taken from Illinois self feeder plan No. 122. The plan shows this feeder as it may be built with or without the extension floor and roof. Building the extension roof and floor makes only a simple change in the plan as shown in broken lines on the right side. The extension type, of course, increases the material and cost of the feeder. If the builder decides to build the extension type the extension will be built on both sides as the hogs feed from both sides (two-way feeder). If the conventional type is built it will be symetrical with both sides straight as shown on the left side of the drawing.

One side of the roof of this feeder is removable in two four-foot sections. There are no hinges, and the sections should afford a weather tight roof. This method has been recommended by herdsmen, including Turner Wright of the State College Animal Husbandry department who has used it and compared it to other types. For the extension type feeder the section of roof would be heavy to handle and for this short feeder a "shovel-in" door in each gable end or hinged doors might be preferable.

The type of agitator used in this feeder is simple and efficient under most conditions. It is similar to the one used in Plan 5215. The bill of material for building it is given on the blue print.

The blueprint plan for this feeder showing more detail costs ten cents. It is plan No. 5214.

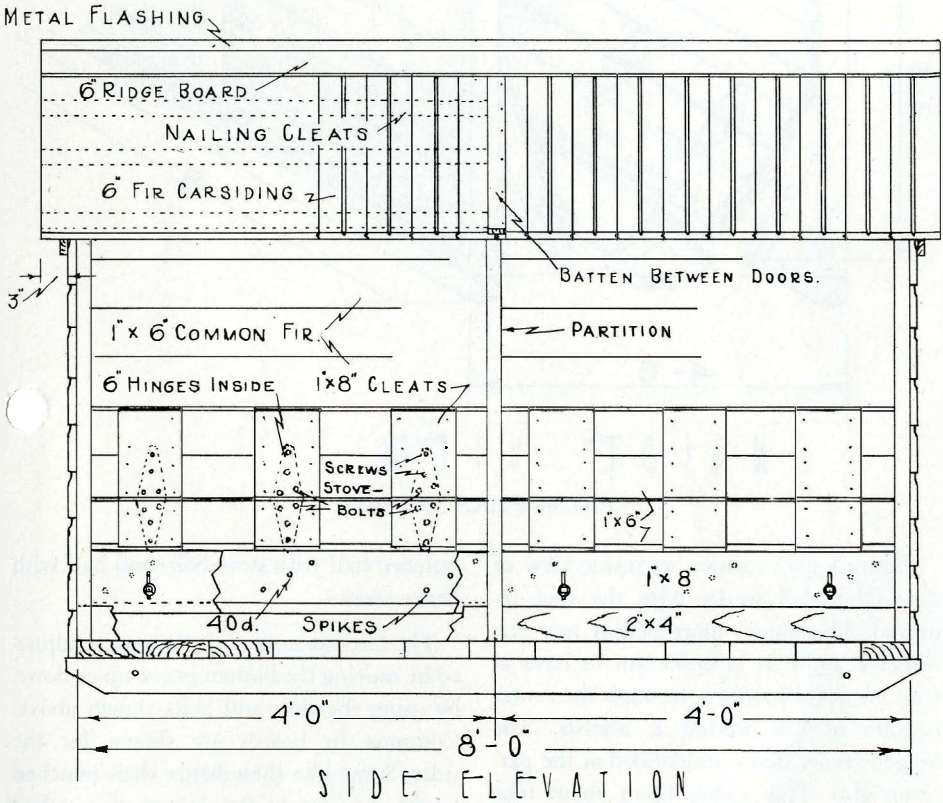


FIG. 5—PLAN NO. 5214

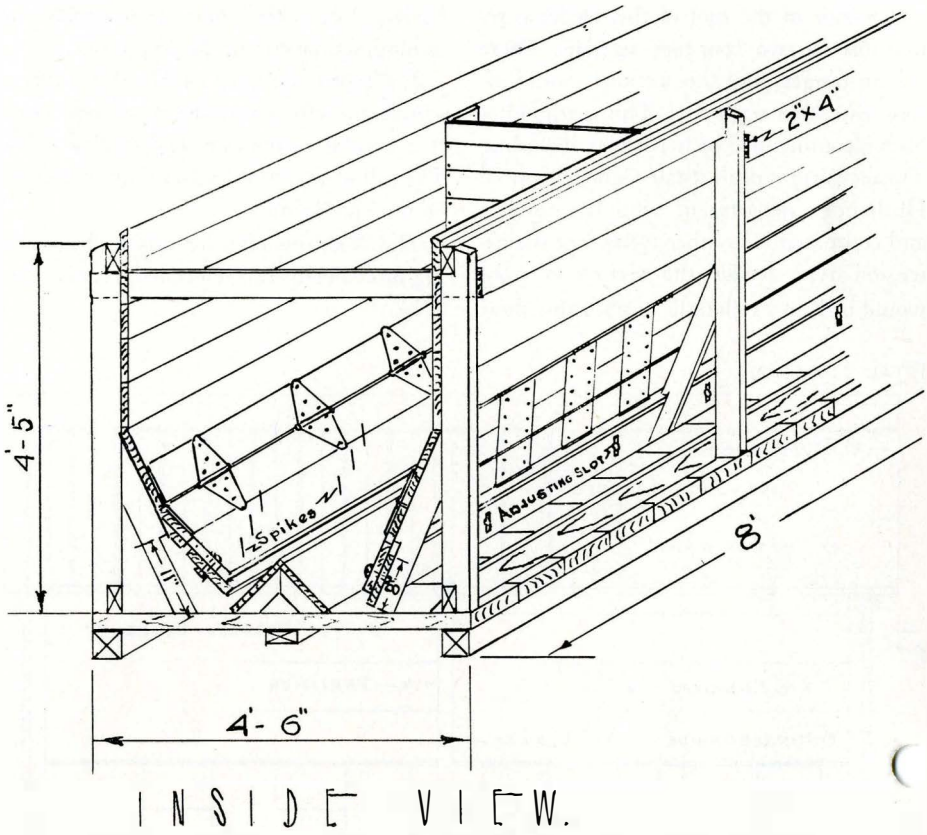


FIG. 6—PLAN NO. 5214

Figure 6 above shows an inside view of the 100 bushel feeder with the roof removed. This shows more plainly how the feeder is built. It is important to have at least one solid partition through the center because of the bracing it affords. The hinged feeder doors are divided at the partition also. This makes them about four feet long which is sufficient. The hinged doors carrying spike nails make the feed agitator for this feeder. The use of screws in place of nails here and there in any self feeder is good practice. The hinges are fastened half with stove bolts and half with heavy screws.

The feed opening at the bottom is adjusted by moving the bottom board up or down by using the slots and bolts shown above. Common fir boards are shown for the sides. Some like these better than matched lumber because of the danger of matched lumber swelling and buckling. If allowance is made for swelling when the feeder is built 6-inch fir shiplap would be satisfactory to use for siding.

The 17 Bushel Feeder

PLAN NO. 77,612

This feeder is approximately 2½ feet wide by six feet long and feeds from both sides. The plan is taken from the Midwest Plan Service and has been available for distribution heretofore. It is listed in Extension Circular 323. As shown in the figures at right there are six feeding compartments provided on each side making 12 in all. Each compartment is slightly less than 12 inches wide and fitted with flaps or lids that protect the feed from rain. The flaps are raised by the pigs as they feed.

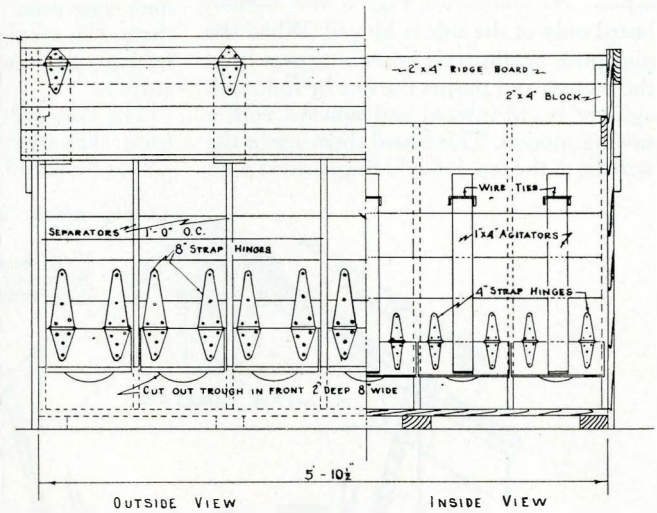


FIG. 7—PLAN NO. 77,612

Swine herdsmen differ as to the number pigs that can be fed satisfactorily from each compartment in this type feeder but the range is from six to 10 pigs for each 12 inch compartment. According to this the feeder would accommodate from 72 to 120 pigs and with a grain capacity of 17 bushels.

Figure 7 showing the side elevation-section may be confusing at first glance, but is not complicated. The left half shows how the feeder looks on the outside closest to the observer and the right half shows the inside of the farther side (front is cut away). The lid or roof of this feeder is hinged on one side. Care should be used in construction at this point to secure a watertight joint. A narrow strip of metal flashing under the ridge board bent up sharply along the edge, out of the way of the raising door, will help. The strip should be bent so as to carry the water toward one end. The feeder is made almost entirely of lumber and is very easily moved. It has the good features of commercial feeders that are made largely from sheet metal and are on the market in normal times.

The Feed Agitator

Special attention might be called to the feed agitator in this self feeder. Although somewhat complicated it has a very positive action. As shown in Fig. 8 the bottom board only of the side is hinged. When the pigs push against this board it moves in at the bottom and pushes the one by four inch agitator board inward and upward with a sawing motion. This board slides up in the wire tie at the top. It could be provided with a few nails which would further increase its positive action. The size of the agitator boards are given on the inside view Fig. 8.

This feeder would have an excellent location on a concrete feeding floor since no floor extension is provided for it. While there is an ever increasing demand for large feeders many hog breeders favor the smaller sizes.

The materials list is given in the blueprint. The blueprint plan shows more details and costs 15 cents. It is plan No. 77,612.

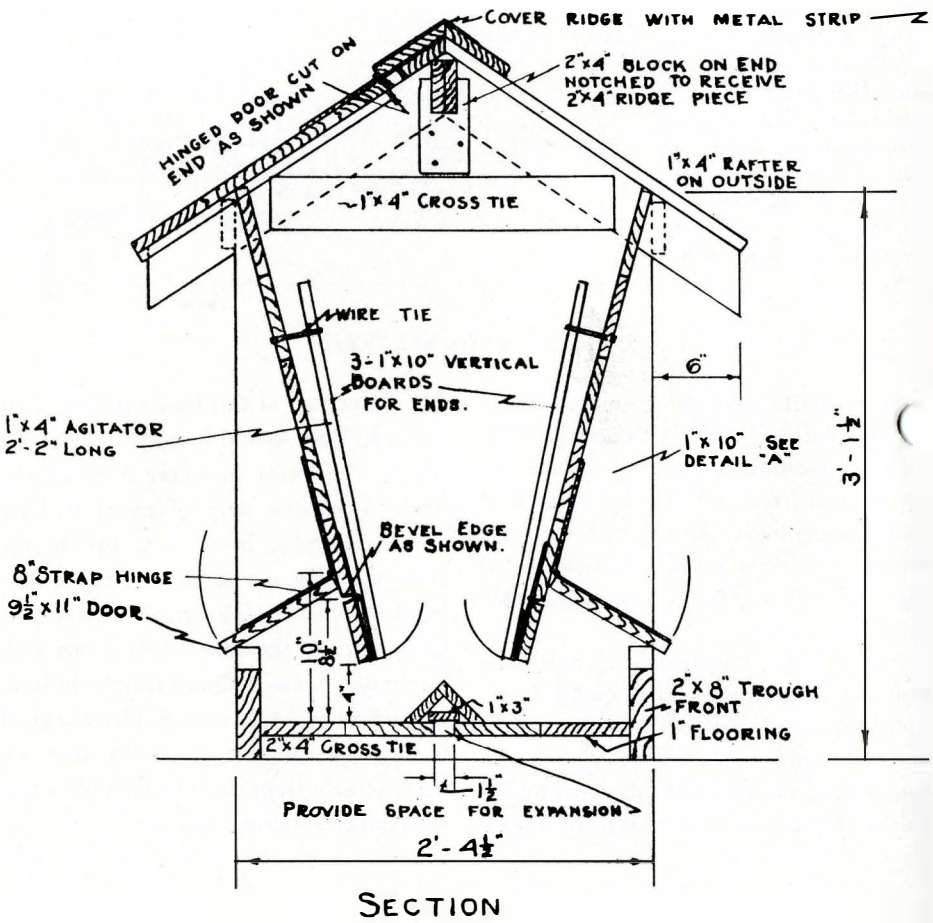


FIG. 8—PLAN NO. 77,612

The One-Way Inside Feeder

PLAN NO. 77,617

This feeder is two feet wide by five feet long and feeds from one side only. This plan is also a Midwest Service Plan and has been available heretofore. The design is primarily for use under a shed or inside the centralized hog house as it is supposed to set with the one side against the wall or fence. Although it holds only 10 bushels of grain or ground feed, it will accommodate from 30 to 50 pigs. That is figured at the rate of 6 to 10 pigs for each feeding compartment.

The feeding compartments are fitted with flaps as with plan 77,612. The flaps are made of one-inch yellow pine boards. They are raised by the pigs while feeding. This feeder has a considerable amount of sheet metal covering on it, to protect it from the weather and chewing of the hogs. The hopper is also partially lined with metal to make the feed slide.

Since the feeder should fit against the wall and take up the minimum floor space the roof projection is held to a minimum. The feeder is also equipped with iron-rod hand-holds on each end for moving. Since this is a plan of the Midwest Plan Service the blueprints can be secured from any one of the state colleges of fifteen states here in the midwest. This applies also to the preceeding plan which is also a Midwest Plan.

The feeder is definitely designed to stand on a hard surfaced floor as it is flat on the bottom. See the feeding floor plan which follows in this circular on page 19.

The materials list is given on the blueprint. The blueprint plan shows many details and costs 15 cents. It is plan No. 77,617.

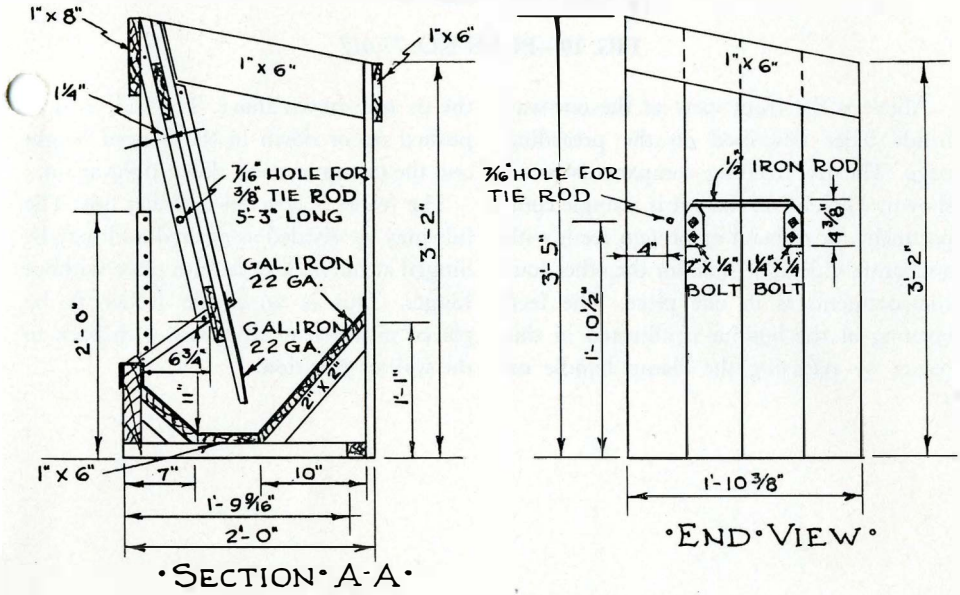


FIG. 9—PLAN NO. 77,617

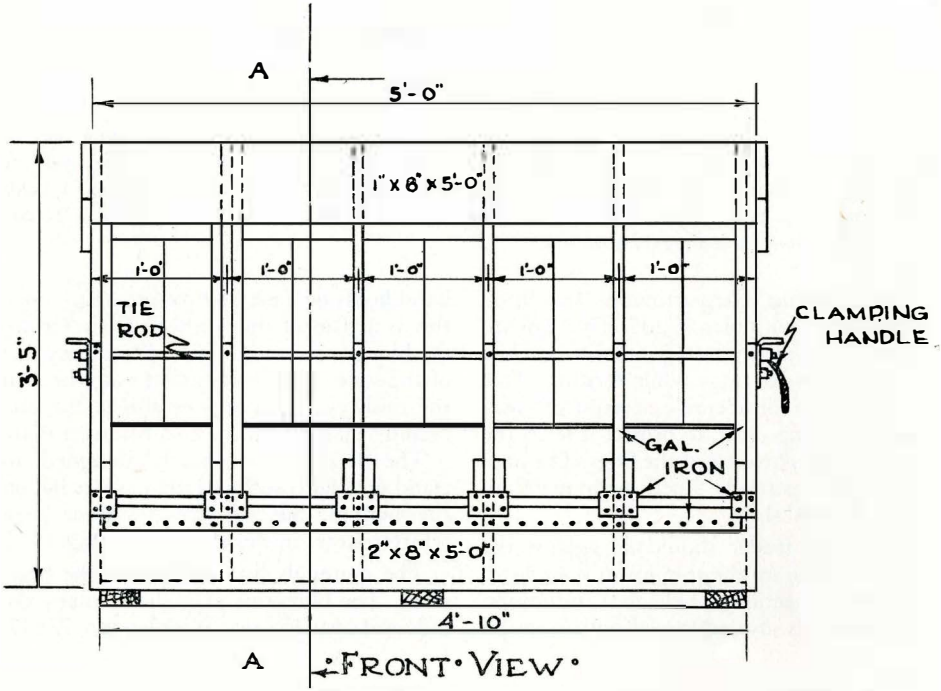


FIG. 10—PLAN NO. 77,617

Above is the front view of the one-way inside feder described on the preceding page. The five feeding compartments are shown. The one on the left is a single compartment for mineral or protein feed, with a separate slide. The slide for the other four compartments is in one piece. The feed opening at the bottom is adjusted in this feeder by releasing the clamp handle on the tie rod shown above. The slide is the pushed up or down to the desired height and the clamp screwed down tight again.

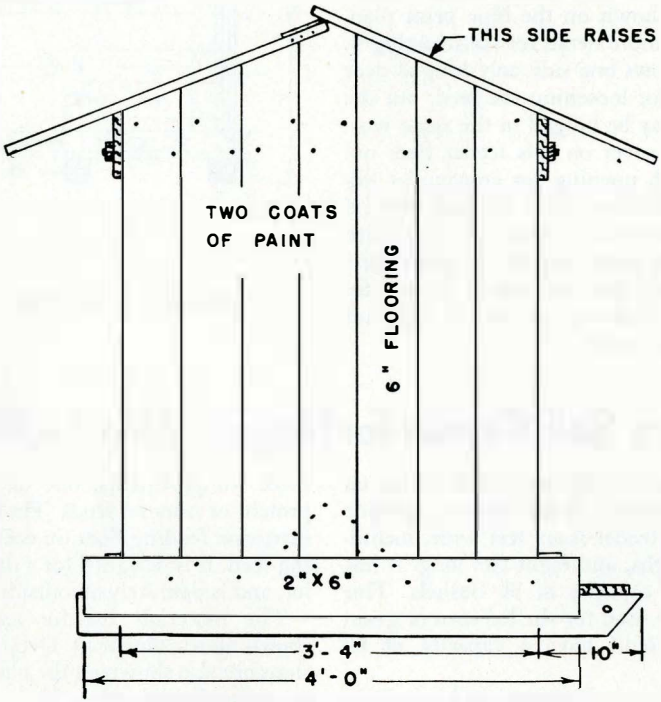
The feeder is covered with flat lids. The lids may be divided as desired and may be hinged at the back or fit into place without hinges. This is an inside feeder to be placed in a pen or driveway with back to the wall or partition.

The Two-Way 25 Bushel Feeder

PLAN NO. 5211

(Self feeder for ear corn on same blueprint)

This feeder is approximately three by four feet inside and holds 25 bushels of grain or ground feed. It is an old style feeder but is simple and easy to build, takes up little room and has given very satisfactory service.



END ELEVATION

FIG. 11—PLAN NO. 5211

This is a box type feeder having a width of four feet, a length of 4 ft., 4 in., and an overall height of 4 ft., 8 in. This makes it a compact feeder that may be used either inside the centralized house or outside in the lot. Since it is so short it has practically no frame and no ridge plank.

The best lumber for building this feeder is probably six-inch carsiding which is now available at most yards. It is definitely better than flooring for the roof and ends of the feeder although flooring is shown in Fig. 11.

The original plan for this feeder was prepared in 1919 and was one of the first, if not the first, plan with the hinged side agitator. The lower two boards on one side are hinged to swing in for loosening the

feed. It is advisable to make the other side the same way. If this does not loosen the feed satisfactorily spikes may be installed to give more positive action.

The side elevation shown at right Fig. 12 is for the two-way 25 bushel feeder described on the preceding page. The cross section plan for this feeder is not shown here but is shown on the blue print plan, which gives more detail for constructing it. The plan shows one side only hinged near the bottom for loosening the feed, but the other side may be hinged in the same way. The hinged cover on this feeder does not allow enough opening for convenient filling. Many builders have divided this lid into two parts and fit them in place with cleats—doing away with the hinges entirely. If fit snugly they will stay in place without hinges and one or both can be lifted off for filling the feeder.

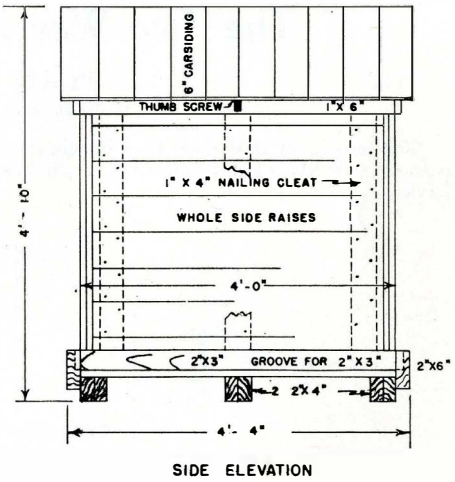


FIG. 12—PLAN NO. 5211

Ear Corn Self Feeder for Hogs---Also on Plan 5211

An ear corn self feeder plan is shown on the same blueprint. It is a two-way outside feeder. This feeder is six feet wide, including the troughs, and eight feet long. It has an ear corn capacity of 30 bushels. This feeder can be used for shelled corn or grain also, and would have a capacity of 60 bushels.

The feeder is well framed and is built in three compartments, one of which is for protein or mineral feeds. The feeder has an extension feeding floor on each side for saing feed. It is designed for a dirt floor in the lot, and is definitely an outside feeder.

The materials list for each feeder is shown on the blueprint. Details and dimensions are also shown on the plan which costs ten cents. It is plan No. 5211.

The Six Bushel Feeder

PLAN NO. 5212

This feeder is 15 inches wide by four feet long and with a capacity of six bushels. This includes a small compartment for minerals or protein feeds. The feeder is designed for inside use and is to be placed against the wall or partition fence.

Small feeders are always handy around the hog barn and this plan is for the smallest feeder available at this time. It will fit into the corner of the farrowing pen without taking much floor space and might even be used in the center driveway because of its narrow width. Having no roof projection at the back allows it to fit snugly against the wall and thereby prevent a runway for rats. It is the simplest of all to build and easy to move. The top is a hinged lid. The ends and top may be made of wide

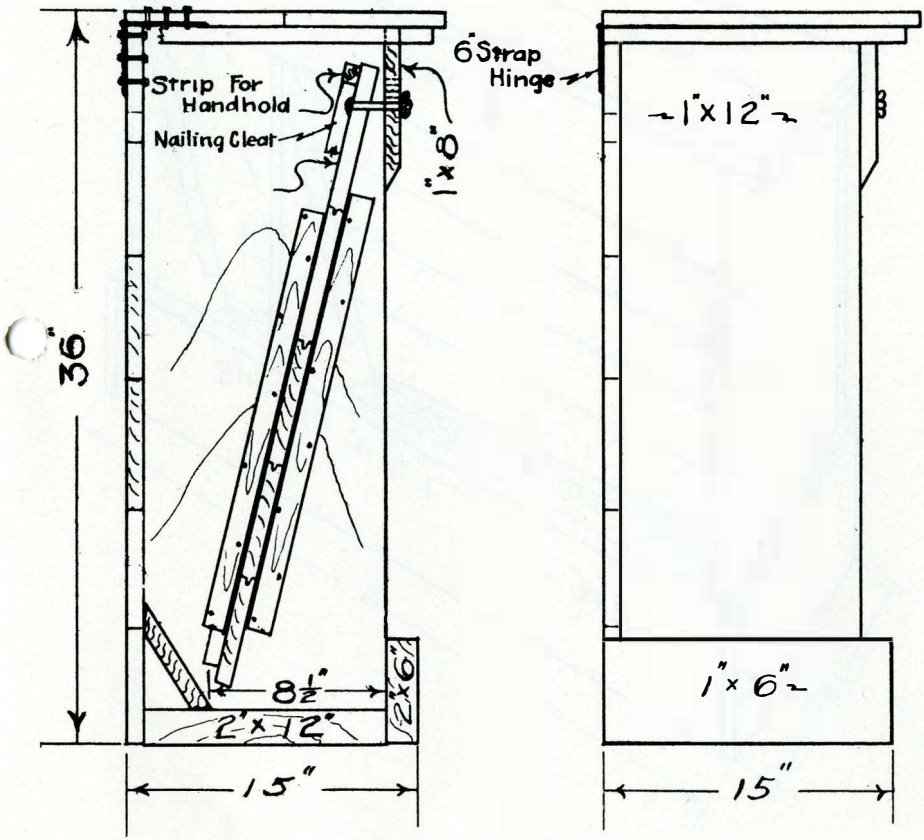


FIG. 13—PLAN NO. 5212

boards but heavy nailing cleats should be used on wide boards to prevent them from warping. The use of a few heavy screws in these cleats is good practice since they hold better than nails.

Some screws should also be used in the cleats that form the groove for the feeder front to slide in as the bottom opening is adjusted for different feeds. This feeder is as easy to build as a box.

The materials required for building it are listed on the blueprint plan. Details and essential dimensions are also shown on the plan which costs 10 cents. It is plan No. 5212.

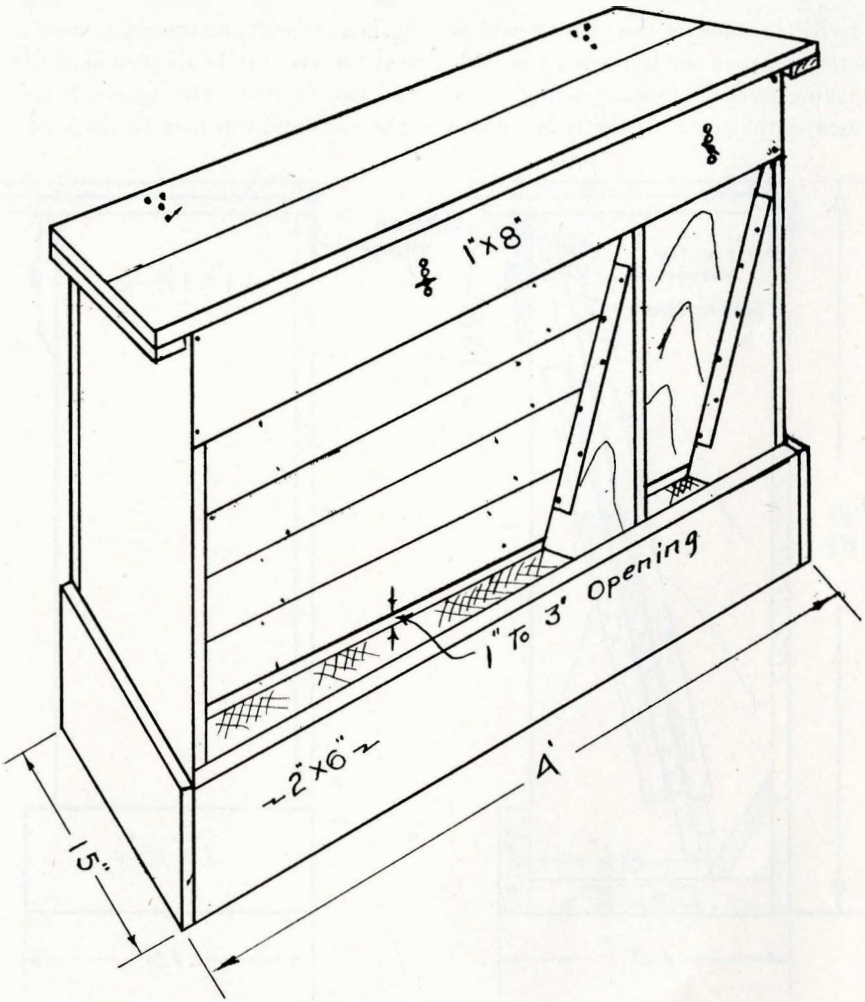


FIG. 14—PLAN NO. 5212

Alfalfa Rack

PLAN NO. 5219

This rack is 3½ feet wide by eight feet long and is primarily designed for inside use. It could be used outside, however, especially if placed on a concrete feeding floor.

In building an alfalfa rack there are two or three things that should be considered. The feeder should prevent too much waste of the hay and at the same time make it reasonably easy for them to reach. The leaves should be saved as much as possible and this is the reason for the troughs along the sides. The space between slats should not be too wide or the smaller pigs will bother in getting inside the rack. The size of the rack will depend somewhat upon the width of doors through which it may be desirable to move it. This rack is light but substantial. One by three slats are suggested because they are large enough and reduce the weight of the rack and the builder can have six inch lumber ripped for them at almost any lumber yard.

The materials list of lumber is shown on the blueprint. More details and dimensions are also given on the print which costs ten cents. It is plan No. 5219.

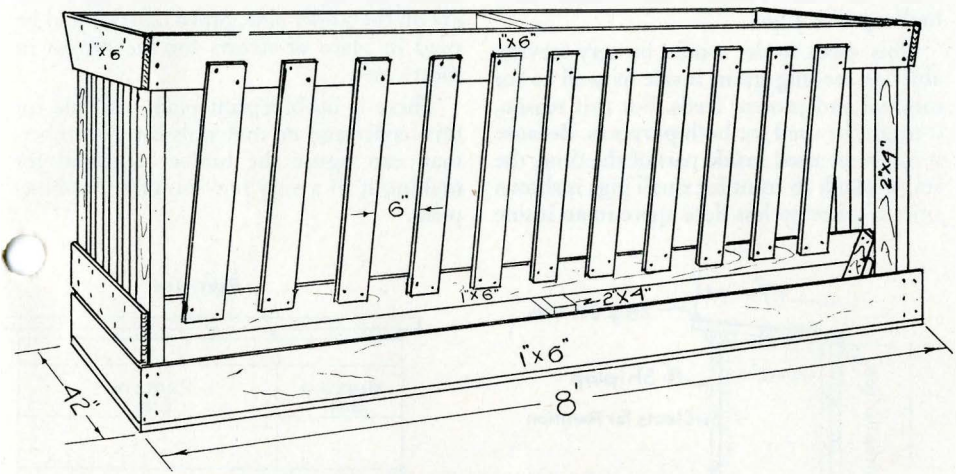


FIG. 15—PLAN NO. 5219

A Mineral and Protein Feeder

This small feeder is designed for use along with the large feeders that are used for grain feeds and having no small compartments for mineral or tankage.

The feeder has only two bins but three feeding compartments with flaps. One feeding compartment is for mineral and two are for protein feeds. The feeder proper is two feet wide by three feet and eight inches long. It is designed for outside use as well as inside and will hold a bag of mineral and two bags of protein feed with some room to spare.

This feeder is easy to make especially for a flap type feeder. It sets up out of the mud and has a platform made from a 12 inch plank so that the younger pigs can feed from it.

In building this feeder the floor should be built first, except the front plank. The bottom should then be boxed-in with the 2 x 6 plank for sides and front and a 2 x 4 flat, at the back. The ends and sides are then built up like a box.

This small feeder would be very serviceable for feeding grain inside as well as for mineral and protein feeds. For this reason, it might be used for both purposes. Because it might be used inside part of the time, the single plank in front for small pigs is shown since it takes up less floor space in an inside pen. If it is to be used outside exclusively, this platform should be two planks wide.

Two vertical nailing cleats are shown on the outside of the back of the feeder and the hinges fasten through them. The nailing cleat for holding the partition between bins will serve as a nailing cleat for the front side of the feeder also. The cover has nailing cleats for the hinges. They are 1x6 corresponding to the ones on the back but are on the under side. Stove bolts should be used in place of screws for the hinges in most cases.

There is no blueprint plan available for this feeder and no materials list. A lumberman can figure the lumber required for making it in a very few minutes. No blueprint.

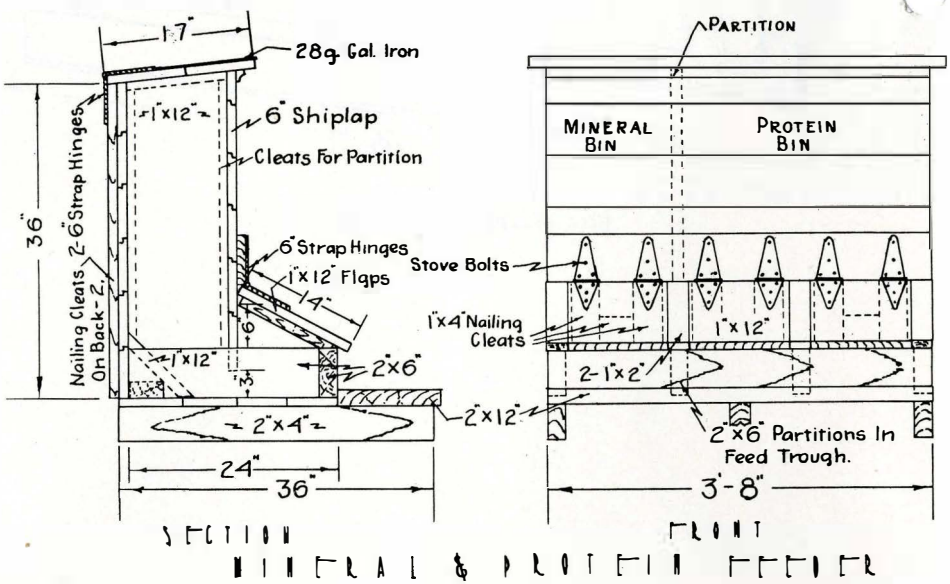


FIG. 16

A Concrete Feeding Floor for The Hog Lot

This floor is not only a feed-saver but it provides a good location for the self feeder in poorly drained lots. It also improves sanitation of the lot. If possible it should be located in the lot so the water from it, during rains, can be drained away outside the lot without creating more mud.

No material is as satisfactory for feeding floors as concrete and they must be well built because they are outside. They must resist freezing and thawing in this climate and the extremes of temperature cause them to expand and contract excessively. A concrete floor that might be satisfactory inside a livestock building would not do for an outside floor. The mixture must be richer. Thicker expansion joints must be provided. And some reinforcing with heavy woven wire is a good pracice but is not absolutely necessary if the aggregate (sand and gravel) is good quality.

In making a feeding floor, the curb is built first. It is like a light foundation and extends completely around the floor, except for a two-foot gap left in the lower end for drainage. The curb keeps the floor from being undermined around the edge and extends three inches above the surface of the floor to keep ear corn from rolling off. The concrete mixture should be 1—2½—4 (1 measure of portland cement, 2½ measures of sand—4 measures of gravel or crushed rock). No rock should be used larger than the fist. In no case should there be more than two and one-half measures of sand to one measure of cement. If the builder is familiar with the "water-cement ratio" test, not more than six gallons of water should be used for each sack of cement. This rule can be used for the mixture in place of the 1—2½—4—mixture rule. In no case should the mixture be sloppy. It should be just wet enough to work into the forms well. Sloppy mixtures make very poor concrete.

After the curb is built and the forms removed, the forms are laid out for the floor. An inexperienced builder should stake the forms out in strips leaving a width of five feet for each strip of floor. Allowance should be made for the thickness of the form boards but not for the expansion joints. The floor is built in alternate strips and also in alternate squares of floor, each five feet square.

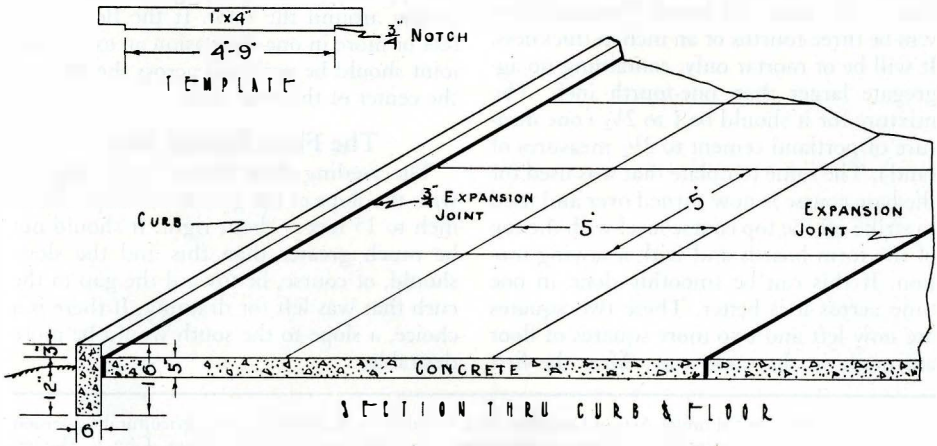


FIG. 17

The thickness of the floor for South Dakota should be five inches but 2 x 6 form boards should be used. After the first strip is framed, cross forms are put in for the five foot squares. Just before this, however, a three-fourths inch insulation board (preferably tar treated material) is cut in five inch strips and laid around the inside edge of the curb for an expansion joint. This expansion joint must go all the way around.

Next, the subbase inside the forms is leveled and packed with a floor rammer until it is just five inches below the top of the form boards. This will be the thickness of the floor.

The Floor Is Poured In Two Courses

The floor should be poured in two courses—for a better floor with less cement. The top is apt to be smoother also and without too much working. A base course is next poured in two of the alternate squares using exactly the same mixture as for the curb—1-2½-4. This course should be made 4¼ inches deep, tamped in place and then roughened on top. A template is notched three-fourths inch for striking off the base course at the right depth. The topcourse should then be placed on these two right away—the sooner the better. The top course will be three-fourths of an inch in thickness. It will be of mortar only, containing no aggregate larger than one-fourth inch. The mixture for it should be 1 to 2½ (one measure of portland cement to 2½ measures of sand). The same template that was used for the base course is now turned over and used to strike-off the top course level with the top of the form boards and with a sawing motion. If this can be smoothly done in one time across it is better. These two squares are now left and two more squares of floor are made in the same way. After the first ones have stood for three or four hours on a warm day the surface should be ready to finish. This should be done with a wood float (never with steel) so it will be left roughened. The float may be used in a sweeping circular motion. If the surface is too hard the float should be dipped in water occasionally. At this point a floor can easily be spoiled by troweling too much. If it can be made smooth in once or twice over it will be better. When the alternate strips are entirely finished, cross forms are put in the remaining ones and the floor is then completed in the same way.

Curing the Surface

About three of four hours after each square is finished on top, it should be sprinkled with water and kept damp until it is hard enough to cover with soft moist soil. This keeps the surface from drying out and makes it hard and tough instead of dry and brittle. The soil should be left on top for about one week before using the floor.

Expansion Joints in the Floor

As mentioned above, expansion joints are absolutely necessary when a curb is used around the outer edge. The strips of expansion board should be not less than three-fourths inch in thickness and extend completely around the floor. If the floor is 30 feet or more in one dimension an expansion joint should be provided across the floor in the center of the long way.

The Floor Should Slope

The feeding floor should slope slightly with the slope of the ground. A slope of one inch to 15 feet is about right. It should not be much greater than this and the slope should, of course, be toward the gap in the curb that was left for draining. If there is a choice, a slope to the south would be more desirable.

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