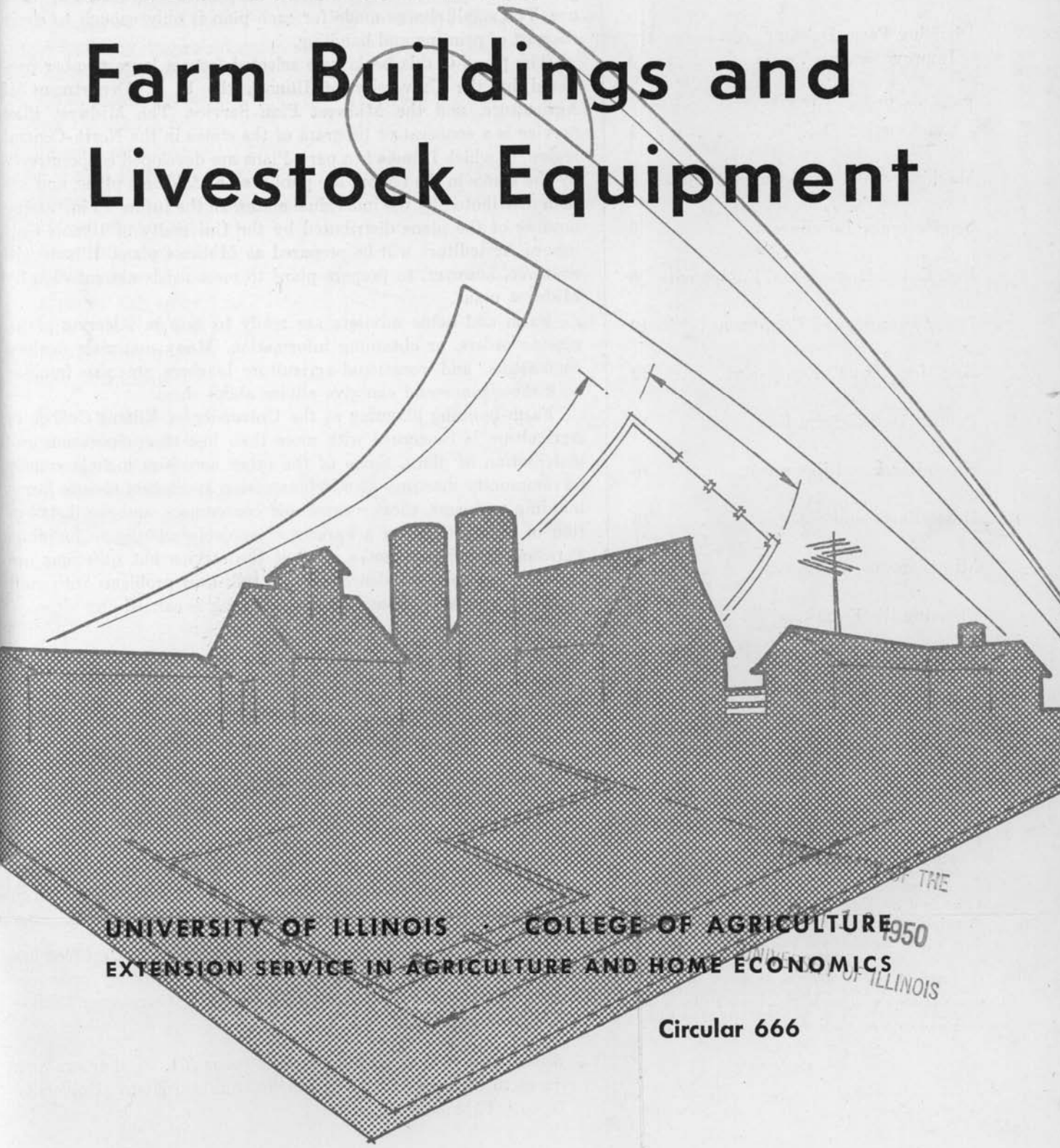
PLANS for Farm Buildings and Livestock Equipment



UNIVERSITY OF ILLINOIS · COLLEGE OF AGRICULTURE
EXTENSION SERVICE IN AGRICULTURE AND HOME ECONOMICS

Circular 666

CONTENTS

(Prepared by DEANE G. CARTER, J. O. CURTIS, and K. H. HINCHCLIFF of the Department of Agricultural Engineering)

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Urbana, Illinois August, 1950

The Plans in This Book . . .

The plans that you will find listed on the following pages are generally recommended for Illinois. They have been tested by wide use. The small charge made for each plan is only enough to cover the cost of printing and handling.

The plans in this book were selected from a large number prepared by the University of Illinois, the U. S. Department of Agriculture, and the Midwest Plan Service. The Midwest Plan Service is a cooperative program of the states in the North-Central region, of which Illinois is a part. Plans are developed cooperatively by the states in the region, are published as Midwest plans, and are then distributed by the individual states. In the future an increasing number of the plans distributed by the University of Illinois College of Agriculture will be prepared as Midwest plans. Illinois will continue, however, to prepare plans to meet needs not satisfied by Midwest plans.

Farm and home advisers are ready to help in selecting plans, placing orders, or obtaining information. Many materials dealers, contractors, and vocational-agriculture teachers are also familiar with these plans and can give advice about them.

Farm-building planning at the University of Illinois College of Agriculture is concerned with more than just the preparation and distribution of plans. Some of the other activities include county or community meetings at which extension specialists discuss farm-building problems, short courses and conferences, and the distribution of publications on a variety of subjects relating to building. Personal planning is not a part of the service but questions are answered by correspondence, visitors talk over problems with staff members, and some demonstration planning is carried on.

How to Order . . .

Plans. Send orders and payment to the Department of Agricultural Engineering, University of Illinois, College of Agriculture, Urbana, Illinois. List plans by name and number.

Illinois and regional publications (*page 19*). Write to Department of Agricultural Engineering, University of Illinois, College of Agriculture, Urbana, Illinois.

Free publications of U. S. Department of Agriculture (*page 18*). Write to Division of Publications, Office of Information, U. S. Department of Agriculture, Washington 25, D. C.

U. S. Department of Agriculture publications not on free list (*page 18*). Send requests together with check, money order, or postal note to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Small Homes Council publications (*page 20*). Send orders with payment to the Small Homes Council, Mumford House, University of Illinois, Urbana, Illinois.

PLANNING FARM BUILDING IMPROVEMENTS

A long-time program for building construction, maintenance, and remodeling, projected the same way that a crop or livestock program is projected, will keep you from making expensive mistakes in your building improvements. Such a program is the only sound basis for such decisions as whether to make minor repairs on an old building so that it can be used a few more years, make major repairs and alterations on an existing building so that it will serve many more years, or build a new building.

If you decide on a new building, you need to give careful consideration to several questions before you are ready to build. What is the best way to arrange the space in the building? How large should it be? What building materials ought to be used? How much ought you to spend? Where should you locate it?

Start with a good plan. Those that you find in this book will help you make a good choice, whatever building you have in mind. They have been planned and designed in line with the recommendations of the College of Agriculture. The building types, measurements, arrangements, and constructions they show have been proved by research and experience. Even though no one of the plans satisfies your building needs in every detail, the plans can be used as a guide to good construction and effective arrangement.

The special requirements and problems of different farm enterprises have been considered in developing these plans. For example, sanitation has been emphasized in designing structures for use in hog production. Shelters and equipment for beef cattle aim for efficient handling of the animals. Dairy barns and milkhouses meet the requirements for the production of grade A milk. Cribs and bins have been designed for safe storage and conditioning.

In deciding on a plan, you will normally have to choose between two or more systems of housing. For example, you will need to decide whether you prefer the loose housing barn for your dairy cattle or the stanchion barn, whether you will use individual houses or a central house for swine farrowing, whether you want ground level or loft storage for hay, and whether you will have ear-corn cribs or shelled-corn bins.

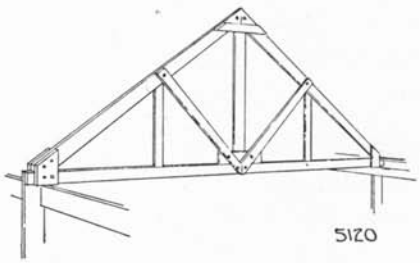
Figure building size and capacity carefully. Adjust to the amount of crops, livestock, and equipment you will store or house. Most of the plans in this book are for buildings of a definite size, but in the exact size shown they would meet the needs of only a few farms. The size can be varied to meet the needs of the individual farm; the plans will show good arrangements and standard methods of construction. Ordinarily farm buildings can best be varied in size by changing the length without affecting width, height, or type of construction.

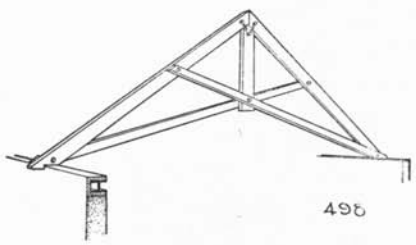
Choose a suitable building material. Most of the plans are adaptable enough that materials other than those shown on the plans can be used. Roofing materials are usually not indicated, so their choice is left entirely up to the builder. Prefabricated parts or fully prefabricated buildings can be used in place of ordinary construction; the plans can then be used merely as a guide to effective space arrangement.

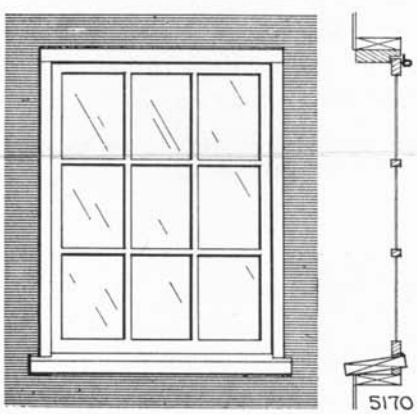
Balance amount spent against expected return. Buildings must pay out in terms of their value for shelter, storage, labor saved, and improved quality of products. You normally cannot justify elaborate buildings where low-cost buildings — pole frames, open sheds, or straw shelters — will serve the purpose. You may justify a higher investment, however, where increased returns can be expected from better-quality buildings.

High costs of construction can best be offset by carefully planning each step of the job to insure that you get the maximum improvement for each dollar spent. There is no magic way to cut down building costs. You can, however, make a sizable reduction in the cash outlay by using as much of your own labor as possible. Using materials already on the farm or available locally will also help.

Locate the building wisely. A good location may mean the difference between convenience and efficiency on one hand and dissatisfaction on the other. Give careful consideration to such things as sheltered yards, windbreaks, drainage, access from driveways, and distances between buildings.







FRAMING PLANS AND CONSTRUCTION DETAILS

Most of the complete plans for farm buildings listed on the following pages include a floor plan, construction views, exteriors, and plan or construction details for that particular building. Often what is wanted, however, is a typical standard design that can be adapted for a barn, shed, or utility building, according to individual needs. Several such designs are given below.

These framing plans and construction details can be used with any one of a number of floor arrangements or for buildings that lend themselves to various purposes. The widths shown on the plans are the most common or standard widths. Lengths can be adjusted to fit the needs of the farm exactly, since most of the buildings can be extended by 2-foot units of length.

GABLE-ROOF FRAME, post supported, 1 story. Plan 497 (*15¢*). 34 or 36 feet wide. No overhead storage. (*Top left*)

GABLE-ROOF FRAME, post supported, 1 ½ stories. Plan 5119 (*15¢*). 32, 34, or 36 feet wide. Limited hay storage overhead.

GAMBREL-ROOF FRAME, 2 stories. Plan 5174 (*15¢*). 32, 34, or 36 feet wide. Self-supporting roof. Large loft capacity. (*Top center*)

GOTHIC-ROOF FRAME, 2 stories. Plan 5172 (*15¢*). 32, 34, or 36 feet wide. Self-supporting roof. Large loft capacity. Either commercial or home-built rafters can be used. (*Top right*)

TRUSSED GABLE-ROOF FRAME, 1 story. Plan 5120 (*15¢*). 34 or 36 feet wide. Trusses spaced 2 feet apart; lower chord of truss forms horizontal ceiling joists. No interior posts. (*Left*)

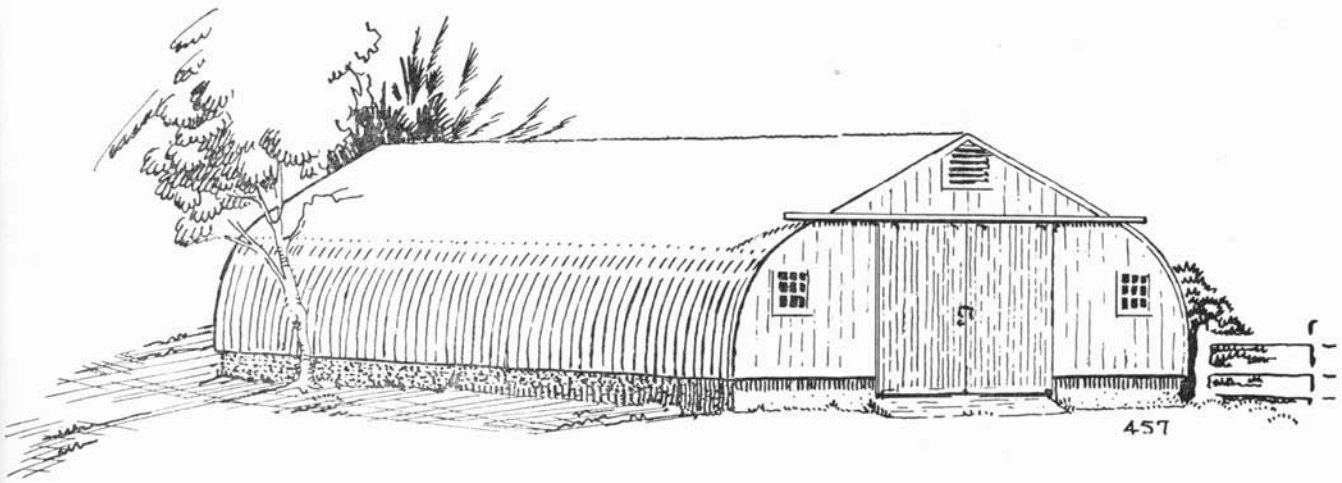
SCISSORS TRUSS, GABLE-ROOF FRAME. Plan 498 (*15¢*). 24, 28, and 32 feet wide. Lower chord of truss slopes to give more headroom in the center than near the walls. (*Left*)

FRAMING FOR SMALL BUILDINGS. Plan 5573, sheet 2 (*15¢*). Trussed frame, 1 story, 24 feet wide; also 2 stories, 20 feet wide.

SHED FRAMING. Plan 419 (*15¢*). Framing details for shed additions to existing buildings. Shed widths of 14, 16, 18, or 20 feet. (*Left*)

WINDOW FRAMING. Plan 5170 (*15¢*). Details for five common types. (*Lower left*)

BARN DOORS. Plan 5171 (*15¢*). Construction and framing details for four types: single sliding, double sliding, "dutch" door, and hay door.



MACHINERY AND EQUIPMENT STORAGES

With more and larger machines on farms, there is perhaps greater need for new machinery storages than for any other farm building. On most farms the amount of machinery has simply outgrown the storage space. Expensive machinery either sits out in the weather or is inadequately stored.

The present trend is toward a building that serves as a machinery headquarters rather than just a machine shed. Such an arrangement is shown by Plan 499, below, which not only provides for storage space but includes a shop and facilities to service and repair machinery. The advantages of such an arrangement are worth considering when planning a new machinery-storage building. (Any of the sheds listed below can easily be made into a simple form of machinery headquarters by building a small shop along one of the walls.)

MACHINE SHED, arched roof. Plan 457 (*15¢*). 36 feet wide. Can use either home-built or commercial rafters. (*Top*)

MACHINE SHED, trussed gable roof. Plan 275 (*15¢*). 26 feet wide. (*Right*)

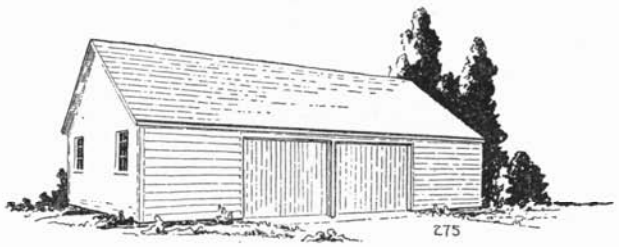
MACHINE SHED, trussed gable roof. Plan 247 (*15¢*). 28 feet wide. Shop and garage attached.

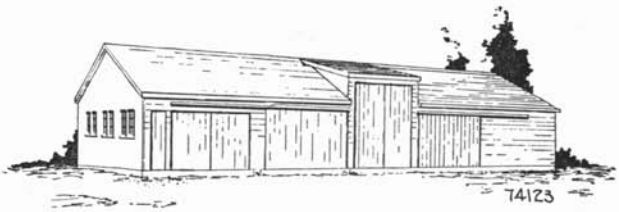
MACHINE SHED, raised center section. Plan 74123 (*45¢*). 26 feet wide. Center section will accommodate high machinery. (*Right*)

FARM MACHINERY HEADQUARTERS. Plan 499 (*60¢*). 32-x-40 foot arch-roof center section with two 32-x-48 foot gable-roof wings. Center section is for a shop and repair space and the wings for storage. (*Right*)

FARM WORKSHOPS. Plan 463 (*15¢*). Three floor plans for a shop. Can be built as a separate building or as part of another building.

SHOP AND GARAGE. Plan 74112 (*30¢*). Built 20 x 24 feet, provides space for small shop and storage space for two vehicles. (*Lower right*)



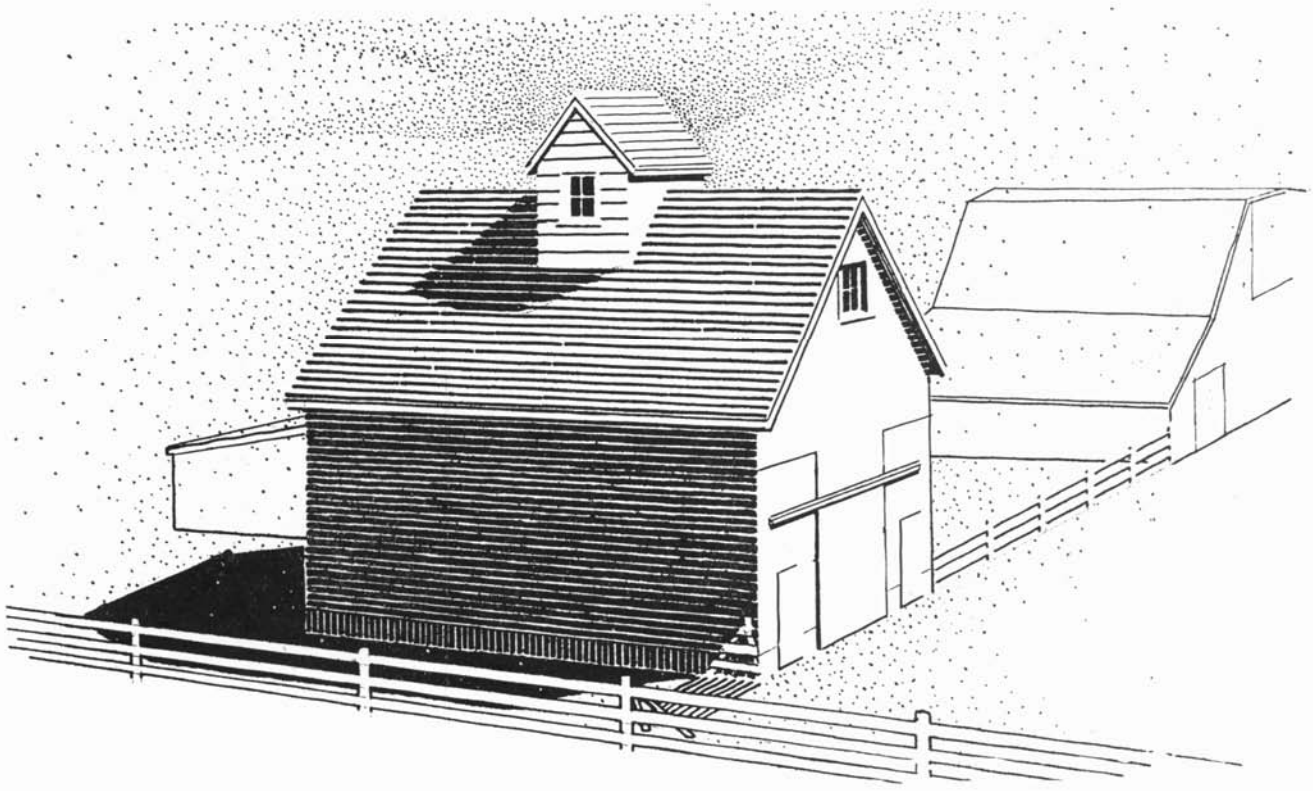


ROUND-ROOF MACHINE SHED convertible to 4,000-bushel ear-corn drier. Plan 74133 (*60¢*).

GABLE-ROOF MACHINE SHED convertible to a 4,000-bushel ear-corn drier. Plan 75513 (*45¢*).

TWO-CAR GARAGE convertible to 2,500-bushel grain bin. Plan 73263 (*30¢*).

TWO-TRUCK GARAGE convertible to 4,500-bushel grain bin. Plan 74132 (*30¢*).



CROP STORAGE BUILDINGS

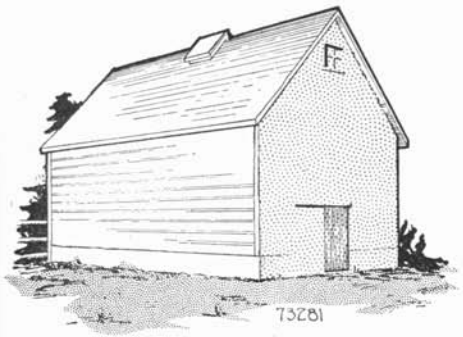
Buildings for crop storage must protect the crops from moisture, rodents, and insects and be strong enough to resist heavy loads. Because they are loaded so heavily, no attempt should be made to build one without carefully prepared plans.

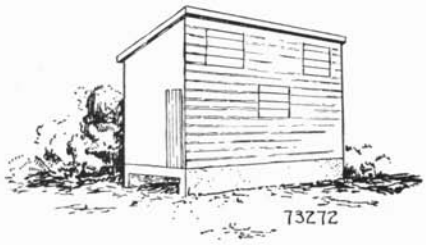
Small grain and shelled corn may be stored in movable bins, permanent ground-level granaries, overhead bins in cribs, and bins in barns. Hay is stored chiefly in buildings used for animal shelter and occasionally in separate hay-storage sheds. Ear corn is stored in the familiar single or double crib, in temporary or semipermanent structures, and in tight structures for artificial drying.

The width of corn cribs to be used for natural drying is fixed by the requirements for air circulation. A crib width of 8 feet is standard in the southern three-quarters of Illinois. In the northern quarter width should normally be limited to 7 feet. Height and length can be varied to give whatever capacity is wanted. The height to the plate line is limited to about 20 feet; otherwise too much corn will be damaged by dropping. The crib can be made any length if an outside elevator is used; with an inside elevator the length is limited to about 40 feet unless a conveyor is used to carry corn to the ends of the crib.

Artificial drying of corn is a growing practice on midwestern farms. Either the ear corn can be dried or it can be shelled and the shelled corn dried. The standard farm crib can be adapted for effective artificial drying. For a double crib the driveway can serve as the main duct, as the illustration below shows. For single cribs or for either side of double cribs, a duct can be built of paper or canvas and placed along the outside wall. Round snow-fence or welded-wire cribs can be adapted for drying by building a central duct in the crib. Details for adapting cribs for drying are given in AEng 545, "Drying Corn in Cribs."

The plans on page 7 that are marked with a star (*) are illustrated and described in more detail in a plan book, "Grain Storage Building Plans," available from the Department of Agricultural Engineering for 25¢.





PLANS FOR CROP STORAGE BUILDINGS

CRIB AND GRANARY. Plan 73283 (*30¢*). Gable roof. Two 8-foot cribs, 11-foot driveway, overhead bins. When built 32 feet long, has a capacity of 3,200 bushels of ear corn and 2,000 bushels of small grain. (*Page 6, top*)

CRIB ADAPTED FOR ARTIFICIAL DRYING. Plan 73281 (*30¢*). Two 8-foot cribs with 4-foot alleyway between. Alleyway can serve as the main duct to dry the corn artificially. (*Top left*)

SMALL CRIB AND GRANARY. Plan 413 (*30¢*). Two 8-foot cribs, 9-foot driveway, limited bin space overhead. When built 28 feet long, has a capacity of 1,800 bushels of ear corn and 800 bushels of small grain.

SINGLE CRIB. Plan 73272 (*15¢*). Shed roof. Built 8 feet wide, 32 feet long, with 12-foot front height has a capacity of 1,000 bushels. (*Top center*)

SEMIPERMANENT CRIB. Plan 73271 (*15¢*). Shed roof. 8 feet wide. Pole and snowfence construction. (Also described in sheet 447, "Pole and Snowfence Crib," sent free on request.)

CIRCULAR CORN CRIB. Plan 495 (*free*). Built of native lumber. 12 feet high. Holds 900 bushels of ear corn when built 16 feet across.

PREFABRICATED GRAIN BIN. Plan 73294 (*45¢*). Wood construction. Floor, wall, and roof panels are framed and covered with plywood. Panels are then bolted together to form the bin.

MOVABLE GRAIN STORAGE. Plan 73252 (*15¢*). Wood construction, mounted on skids. When built 12 x 14 feet, holds 1,000 bushels. (*Top right*)

PERMANENT GRAIN STORAGE. Plan 73261 (*15¢*). Wood construction, concrete floor and foundation. When built 12 x 20 feet, holds 1,500 bushels. Readily converted to one-car garage.

LARGE GRAIN STORAGE. Plan 73264 (*30¢*). Two rows of bins 10 feet wide with 11-foot driveway between. When built 40 feet long, holds 8,000 bushels of grain.

HAY SHED. Plan 73101 (*15¢*). Creosoted pole uprights and wood frame. When built 24 x 60 feet with 20-foot side walls, has a capacity of 60 tons of loose hay or 140 tons of baled or chopped hay.

***300-BUSHEL GRAIN BIN convertible to two-pen movable farrowing house. Plan 72626** (*15¢*).

***3,400-BUSHEL GRAIN BIN convertible to six-pen farrowing house. Plan 72627** (*30¢*).

***500-BUSHEL GRAIN BIN convertible to movable brooder house. Plan 72711** (*15¢*).

***MOVABLE GRAIN BIN, 600-bushel capacity. Plan 73251** (*15¢*).

***FOUR-BIN GRANARY, 1,700-bushel capacity. Plan 73262** (*30¢*).

***GRAIN BIN, 2,500-bushel capacity, convertible to two-car garage. Plan 73263** (*30¢*).

***FARM ELEVATOR, 10,000-bushel capacity, stud construction. Plan 73268** (*90¢*).

***FARM ELEVATOR, 10,000-bushel capacity, crib construction. Plan 73269** (*45¢*).

***DOUBLE CORN CRIB. Plan 73282** (*30¢*).

***STEEL GRAIN BIN, 1,000-bushel capacity. Plan 73291** (*30¢*).

***STEEL GRAIN BIN, 2,700-bushel capacity. Plan 73292** (*30¢*).

***GRAIN BIN, WOOD FRAME, 1,200-bushel capacity. Plan 73293** (*30¢*).
Same, 2,700 bushels. Plan 73295 (*30¢*).

***PLYWOOD GRAIN BIN, 1,100-bushel capacity. Plan 73296** (*15¢*).

***4,500-BUSHEL GRAIN BIN, convertible to two-truck garage. Plan 74132** (*30¢*).

***4,000-BUSHEL EAR-CORN DRYER, convertible to round-roof machine shed. Plan 74133** (*60¢*).

***STEEL BIN with ventilated floor, 1,000-bushel capacity. Plan 75503** (*45¢*).

***EAR-CORN DRIER, 4,000-bushel capacity, convertible to gable-roof machine shed. Plan 75513** (*45¢*).

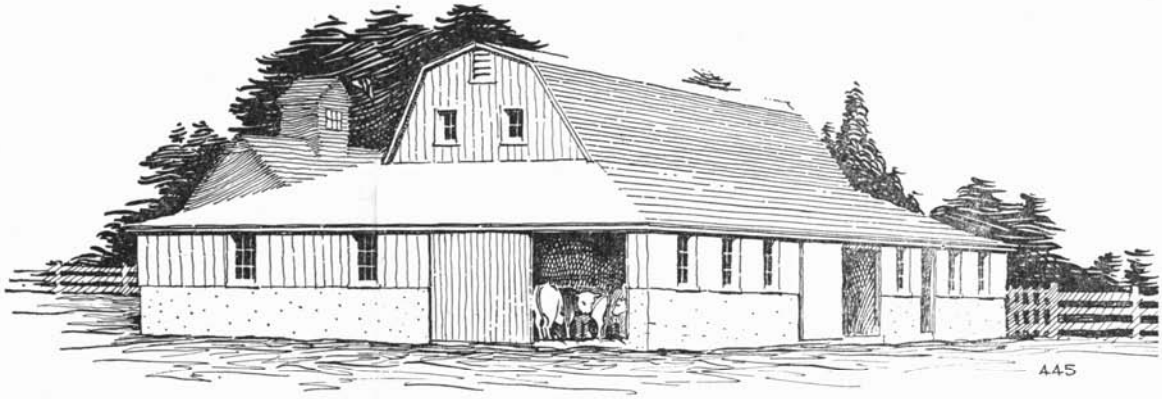
***MOVABLE HOG SELF-FEEDER, 300-bushel capacity. Suitable for short-time storage. Plan 77613** (*15¢*).

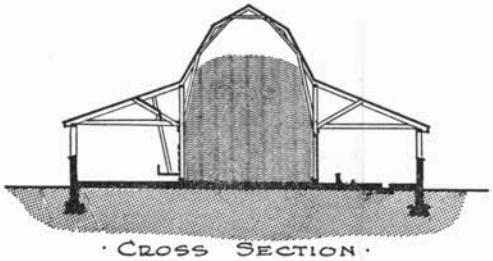
MOVABLE HOG SELF-FEEDER, 400-bushel capacity. Provides weathertight storage. Plan 77614 (*15¢*).

***MOVABLE HOG SELF-FEEDER, drier, and storage unit. Holds 550 bushels of ear corn or 1,100 bushels of grain. Plan 77615** (*30¢*).

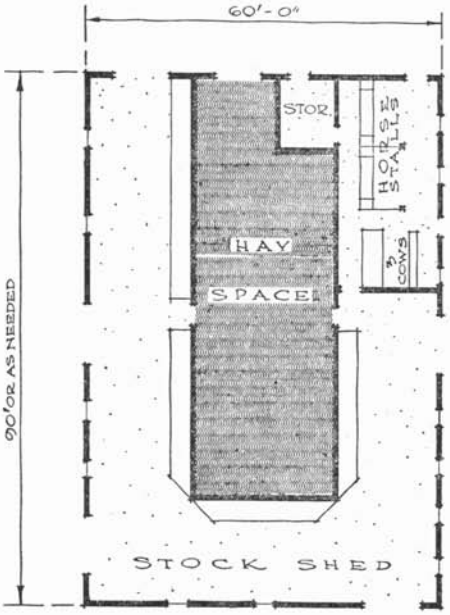
***MOVABLE BEEF-CATTLE SELF-FEEDER, drier, and storage unit. Holds 750 bushels of ear corn or 1,500 bushels of grain. Plan 77416** (*30¢.*)

* For a more complete description send for "Grain Storage Building Plans" (25¢).





· Cross Section ·



· Plan ·

BEEF CATTLE HOUSING AND EQUIPMENT

Beef cattle need a dry bed and protection during cold and stormy weather, but they do not require elaborate housing. A good arrangement of barns and lots, a design that will simplify feeding and management, storage space for feed and bedding, and easy removal of manure are often just as important as shelter.

Both open sheds and enclosed barns are used for housing beef cattle, but in Illinois and surrounding states sheds are more common than barns. In either one, however, some enclosed space is needed for young calves and for cows at calving time.

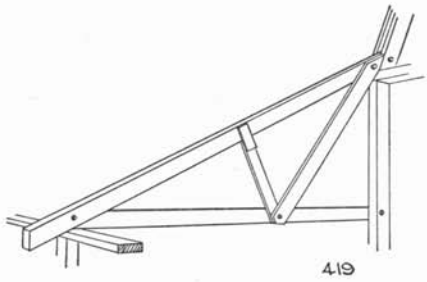
Open sheds usually have the front open to the south or east and are enclosed at the back and on both ends. Permanent sheds should normally be at least 20 feet from front to back, or deeper if racks or bunks are placed inside. At least 8 feet of headroom is needed; 9 feet is better to allow for accumulation of manure and to accommodate power-operated manure loaders. The roof should be self-supporting to give post-free space inside the building and make it easier to use power-operated manure loaders.

Enclosed barns protect the stock better and often have space to store bedding and hay and other feed. The most widely used type of enclosed barn, shown above, has a center section for hay storage from the ground up and attached sheds for the livestock. The sheds for livestock in an enclosed barn should normally be at least 16 feet wide and 18 to 20 feet is better yet. When stock is kept in enclosed barns, it is well to leave some doors open to the south or east.

In most localities a concrete feedlot is recommended. Concrete floors are not necessary in the pen areas, although they are desirable because they are permanent and easier to clean.

On many farms housing for beef cattle can be readily provided by remodeling an old general-purpose barn, if it is in reasonably good condition. All that needs to be done is to remove old pens, stall partitions, and other interior construction not needed to support the loft and then add openings, feed racks, and other equipment.

For detailed planning information, send for North-Central Regional Publication No. 6, "Beef Cattle Housing" (free).



PLANS FOR BEEF CATTLE HOUSING

CATTLE FEEDING BARN. Plan 445 (*30¢*). Gambrel roof, 24-foot center section for hay storage from ground up; 18-foot enclosed sheds on three sides for animal shelter. (*Opposite page*)

CATTLE FEEDING BARN, POLE CONSTRUCTION. Plan 72432 (*45¢*).

CATTLE BARN, TIMBER FRAME. Plan 72431 (*30¢*). Gable roof, 20-foot center section for hay storage from ground up; 16-foot cattle section on two sides. (*Upper left*)

CATTLE BARN, 2 STORIES. Plan 72421 (*45¢*). Gambrel roof, 36 feet wide.

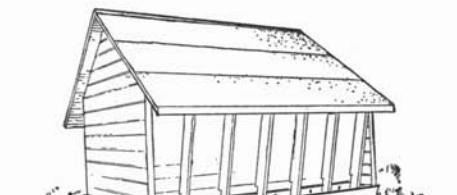
CATTLE SHED, OPEN FRONT. Plan 461 (*15¢*). Trussed gable roof, 24 feet wide. Pole or stud frame construction. (*Upper center*)

CATTLE SHED, POLE CONSTRUCTION. Plan 72408 (*30¢*). Open front, trussed gable roof, 24 feet wide.

CATTLE SHED, L-SHAPED. Plan 72401 (*15¢*). Gable roof, 20 feet wide. Stud frame construction.

Same, concrete-block construction, 24 feet wide. Plan 72412 (*60¢*).

SHED ATTACHMENTS. Plan 419 (*30¢*). For additions to existing buildings; 14-, 16-, 18-, and 20-foot shed widths. (*Upper right*)



PLANS FOR BEEF CATTLE EQUIPMENT

SELF-FEEDER. Plan 470 (*15¢*). For shelled corn, small grain, or ground feed. 12 feet long. For 30 to 35 head. Covered hopper. (*Right*)

MOVABLE SELF-FEEDER. Plan 77416(*30¢*). Suitable also as a drier and storage unit. Capacity, 750 bushels of ear corn or 1,500 bushels of grain. Can be connected to mechanical blower for drying.

FEED BUNK. Plan 77411 (*15¢*). For grain and silage. 30 inches high, 3 feet wide, and 12 feet long. Accommodates 10 to 15 head.

RACK AND BUNK COMBINATION. Plan 422 (*15¢*). For grain, silage, and hay. 12 feet long. Accommodates 10 to 15 head. (*Right*)

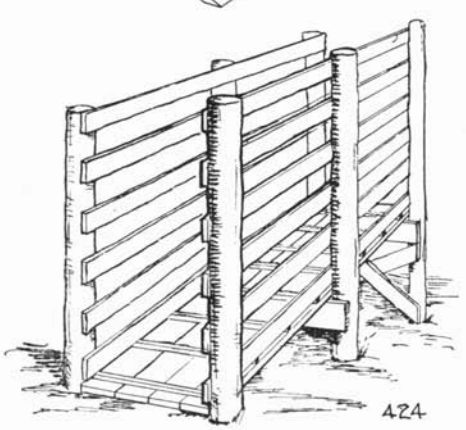
LOADING CHUTE. Plan 424 (*15¢*). Permanently installed. Heavy post and frame construction. (*Right*)

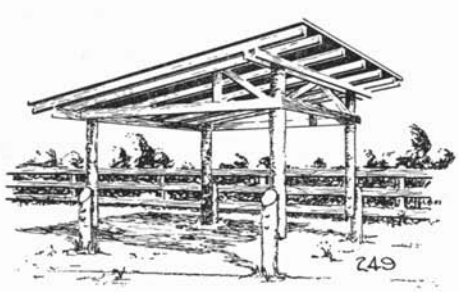
STOCK AND STANCHION. Plan 425 (*15¢*). Heavy post and frame construction.

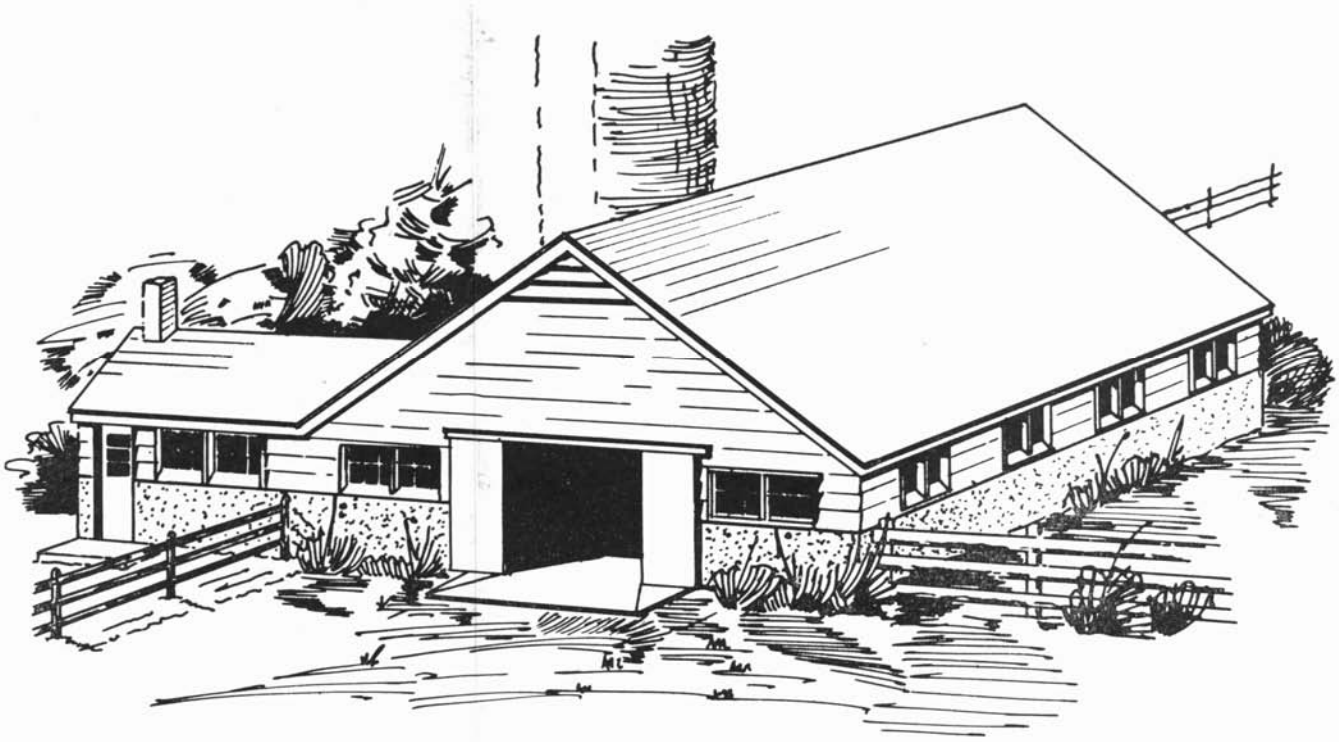
CATTLE GUARD. Plan 451 (*15¢*). Plank construction.

PASTURE SHADE. Plan 249 (*15¢*). Post frame 12 feet square with overhanging roof 16 feet square. (*Lower right*)

BULL PEN AND SHED. Plan 77901 (*30¢*). Plan includes a shed 12 by 16 feet, a pen arrangement, and five types of fences.







DAIRY HOUSING AND EQUIPMENT

Good dairy housing should provide ample space for the animals and for storage of feed and bedding; conditions favorable to the health, productivity, and safety of the animals; sanitation; facilities and arrangements that will save labor; and safe, healthful conditions for workers. These requirements should be met at the lowest cost consistent with good construction.

If milk is to be sold on a Grade A market, many specific requirements in the milk ordinances must be met — details of floor and wall construction, space, location of the milkhouse, ventilation, lighting, and other details. In general these requirements are the same in all parts of Illinois. They do, however, vary in some details from one locality to another, so it is necessary to check plans with the local milk inspector for final approval.

Dairymen have a choice of two common systems of dairy-cattle housing: the stanchion barn and the combination milking barn and pen barn. In stanchion barns a stall is provided for each cow. In winter the cows are often kept in the stalls much of the time except for short exercise periods; feeding, watering, and milking are done while the cows are in the stalls.

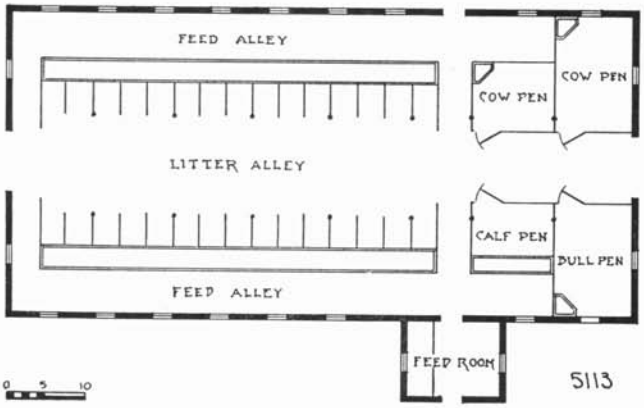
With the milking-barn and pen-barn combination cows are brought into the milking room or "milking parlor" a few at a time and remain there only while they are fed concentrates and milked. The rest of the time the cows are kept in the pen barn and exercise lot. All roughage is fed in racks.

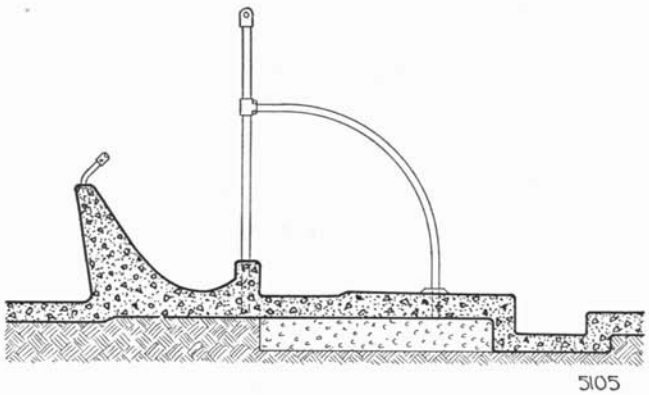
Neither system of housing is recommended in preference to the other. Both are widely used and accepted, and both are suitable for the production of Grade A milk. Which to build depends on each individual case and the operator's preference.

The pen barn requires about twice as much bedding as the stanchion barn, but unless bedding is scarce this is not important. The loose housing of the pen barn may be an advantage in remodeling; an old barn can often be converted to a pen barn and a new milking unit added at much less than the cost of building a new stanchion barn.

The plans listed on page 11 include arrangements and designs for both types of housing. In general they comply with the requirements for production of Grade A milk. Before building, however, have whatever plan you choose approved by the local milk inspector.

For more detailed information on planning dairy housing, send for free Regional Publication No. 7, "Dairy Cattle Housing."





STANCHION BARNS

FLOOR PLANS for barn 36 feet wide. Plan 5113 (*15¢*). 4 face-out and 2 face-in arrangements. (*Top left*)

FLOOR PLANS for barn 34 feet wide. Plan 5117 (*15¢*). 2 face-out and 4 face-in arrangements.

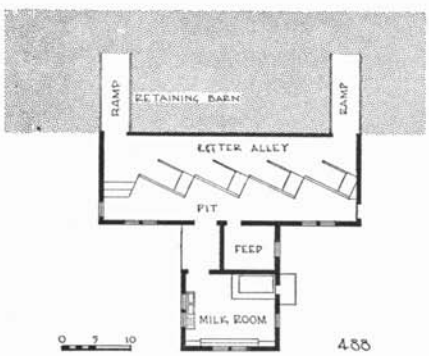
COMPLETE PLAN for barn 34 feet wide. Plan 72311 (*$1.05*). Gambrel roof. Alternate floor plans may be used, or the suggested floor plans can be used with 2-story arch roof or 1-story gable roof.

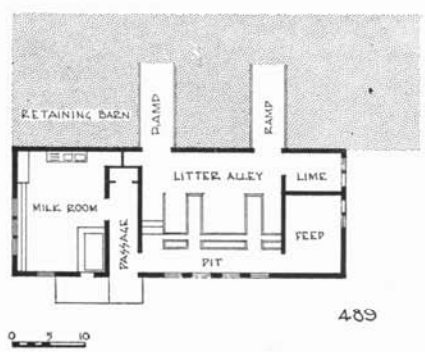
MILKING PARLORS AND LOUNGING BARNS

MILKING PARLOR AND PEN BARN. Plan 487 (*45¢*). Post-supported gable roof, 1 story, 34 feet wide. When built 58 feet long, provides space for a 4-stall milking parlor and shelter area for 16 to 20 cows. Includes details for attached milkhouse. (*Right*)

ELEVATED MILKING PARLOR. Plan 488 (*30¢*). A milking unit to be added to a pen barn. Has four elevated stalls. Operator works in a pit about 3 feet below stall level, so that milking operations are at a convenient working level. Includes details for attached milkhouse. (*Right*)

ELEVATED MILKING PARLOR. Plan 489 (*30¢*). Similar to Plan 488 except that stalls face the alley instead of being set at an angle with the alley. Includes details for attached milkhouse. (*Right*)





MILKHOUSES AND EQUIPMENT

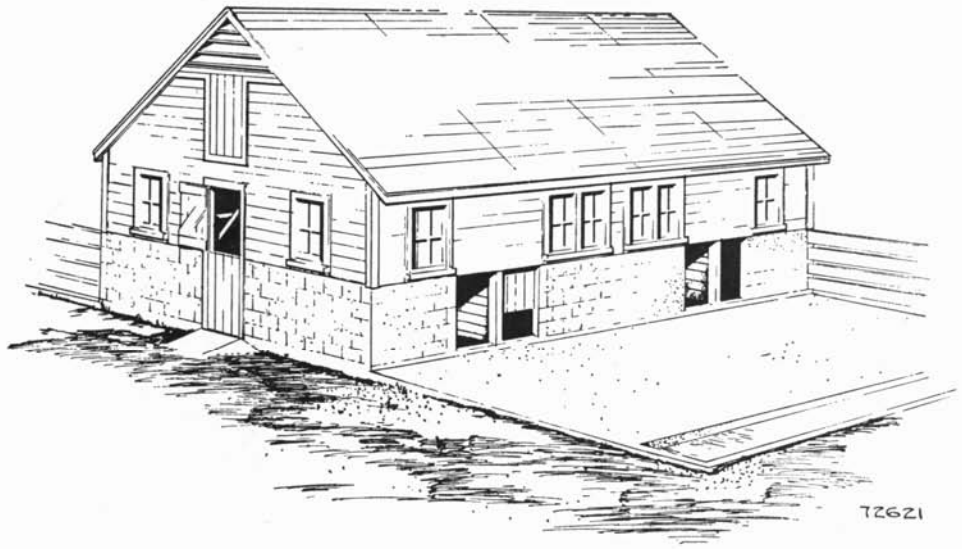
MILKHOUSE. Plan 484 (*15¢*). Recommended 12 x 16 feet for daily production of 20 to 50 gallons and 12 x 18 feet for 50 to 100 gallons. (*Lower right*)

COW-STALL DETAILS. Plan 5105 (*15¢*). Details of two types: a high manger and a raised feed alley. (*Top right*)

CONSTRUCTION DETAILS for concrete cow stalls. Plan 5106 (*15¢*). 4 types shown.

DETAILS FOR COW AND CALF STALLS. Plan 5107 (*15¢*).

New plans on dairy housing and equipment are being developed by the Midwest Plan Service. As soon as these plans are ready, they will be available from the Department of Agricultural Engineering. If the type of plan you want is not among those described here, write for list of plans developed since this booklet was published.



HOG HOUSING AND EQUIPMENT

The most critical time in a hog's life is from birth until it reaches a weight of about 75 pounds. During this period it needs a carefully planned house and protective equipment.

Some of the more important features of a good hog-housing system are:

Enough space for the animals

Protection from cold, wind, rain, and snow, and from too much summer sunshine

Guard rails and other equipment and constructions that will protect the animals

Temperatures and moisture conditions in the house that help to keep the animals healthy and comfortable

Easy to keep sanitary

Opportunity to feed and handle the animals with a minimum of the operator's time

The houses and equipment described on this page and the next were designed with these considerations in mind.

Two types of hog houses are in common use, the individual or movable house and the central house. Individual houses may be used exclusively but are often used to supplement a central house. Both types fit well into good hog-production systems.

Either can be kept clean and sanitary, but this is easier to do with the individual house because it can be moved to clean ground from time to time. Sanitation can be a major problem with the central house unless precautions are taken to get rid of sources of infection.

From the standpoint of the labor required, the central house is preferred. Several litters are together under one roof, and feed and water supplies are convenient. With individual houses care must be taken when locating them to reduce the time and travel needed in handling.

For help in planning and for equipment suggestions, write for Circular 554, "Labor-Saving Hog Equipment," and Circular 562, "Self-Feeders for Hogs" (free).

MULTIPLE-PURPOSE HOG HOUSES AND FEEDERS

On some farms it is a good practice to have constructions which can readily be converted from one use to another. The farrowing houses and self-feeders listed here can either serve as grain storages or be readily converted to grain storages.

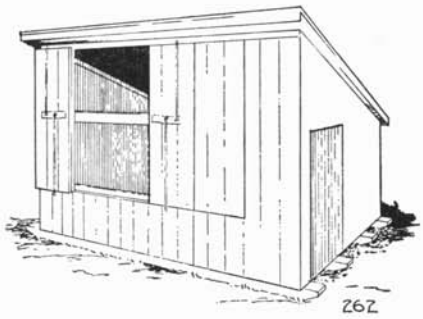
FARROWING HOUSE convertible to 300-bushel grain bin. Plan 72626 (*15¢*). Movable two-unit house. Plywood construction.

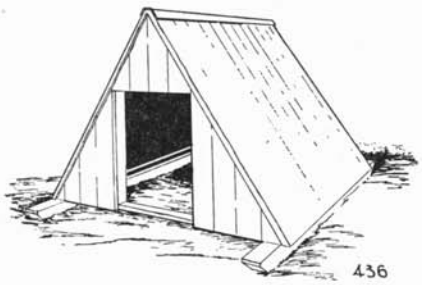
CENTRAL FARROWING HOUSE convertible to 3,400-bushel grain bin. Plan 72627 (*30¢*). Built 24 feet long, it provides space for 6 pens. Small loft overhead.

MOVABLE SELF-FEEDER, 300-bushel capacity. Plan 77613 (*15¢*). Provides short-time grain-storage space in addition to serving as a feeder. Plywood construction.

MOVABLE SELF-FEEDER, 400-bushel capacity. Plan 77614 (*15¢*). Weathertight. Provides grain-storage space in addition to serving as feeder. Plywood construction.

MOVABLE SELF-FEEDER, drier, and storage bin. Plan 77615 (*30¢*). Holds 550 bushels of ear corn or 1,100 bushels of grain. Tunnel under slatted floor can be connected to blower for artificial drying.





PLANS FOR HOG HOUSES

CENTRAL HOUSE. Plan 72621 (*30¢*). 22 feet wide, two rows of pens with alley between. When built 32 feet long, it provides space for 7 farrowing pens and a feed room. (*Opposite page*)

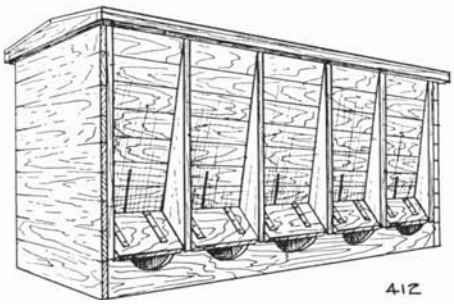
MODIFIED A-TYPE HOUSE. Plan 428 (*15¢*). Movable one-unit house, completely detailed and easy to build. (*Top left*)

ILLINOIS SUNSHINE HOUSE, one unit. Plan 262 (*15¢*). One of the most complete types of movable houses; 7 x 8 feet. (*Top center*)

ILLINOIS SUNSHINE HOUSE, two units. Plan 371 (*15¢*).

A-TYPE HOUSE. Plan 436 (*15¢*). Movable one-unit house. (*Top right*)

SMALL GABLE-ROOF HOUSE. Plan 437 (*15¢.*) Movable one-unit house.



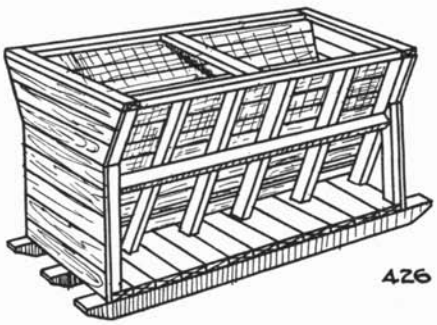
HOG EQUIPMENT PLANS

SELF-FEEDER. Plan 412 (*15¢*). For small grain or shelled corn. Holds 25 to 30 bushels of feed and will accommodate 30 to 40 head of fattening hogs. (*Right*)

SMALL SELF-FEEDER. Plan 118 (*15¢*). For small herds or for young pigs. Holds 6 to 8 bushels.

EAR-CORN FEEDER, covered hopper. Plan 125 (*15¢*). When built 12 feet long, it holds about 75 bushels.

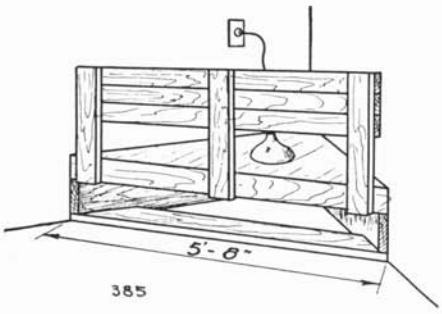
EAR-CORN FEEDER, open hopper. Plan 426 (*15¢*). When built 10 feet long, it holds 75 to 80 bushels. (*Right*)



HOG TROUGH. Plan 411 (*15¢*). Heavy wood construction. Has uprights to keep hogs out of trough.

AUTOMATIC HOG WATERER. Plan 408 (*15¢*). Float arrangement to give automatic control. Has uprights to keep hogs out of trough.

PIG BROODER. Plan 385 (*15¢*). Fits in one corner of the farrowing house or pen. Heated with 100- or 150-watt lamp. (*Right*)



GUARD RAILS. Plan 164 (*15¢*). Six types, using different methods and materials of construction. (*Lower right*)

CREEPS AND HURDLES. Plan 167 (*15¢*). Easy to build.

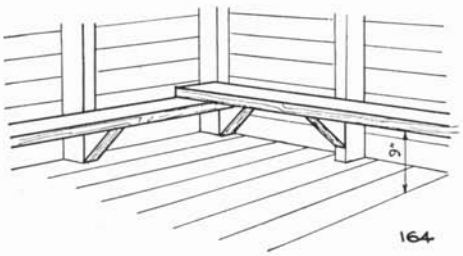
VACCINATING AND CASTRATING RACK. Plan 430 (*15¢*). Simple construction. Can be used for treating young animals.

BREEDING AND RINGING CRATE. Plan 77621 (*15¢*).

LOADING CHUTE. Plan 423 (*15¢*). Permanently located. Height adjustable.

PASTURE SHADE. Plan 429 (*15¢*). Movable; 10 x 12 feet.

SMOKEHOUSE. Plan 5029 (*15¢*). Wood frame construction; 6 x 8 feet.



POULTRY HOUSING AND EQUIPMENT

A farm poultry enterprise usually needs houses for growing stock (fryers, broilers, or replacements); laying houses; and equipment such as nests, roosts, feeders, and waterers. The houses must be carefully designed, especially in the colder regions, to protect the birds from rain and snow, cold wind, dampness, extreme changes in temperature, low temperature, and high summer temperatures.

Houses for growing stock. For farm flocks the common type of house for young chicks or growing stock is a single-unit brooder house from 10 x 12 feet to 12 x 14 feet for 200 to 300 baby chicks. Single-unit houses can be bought prefabricated so that they come to the farm ready to use.

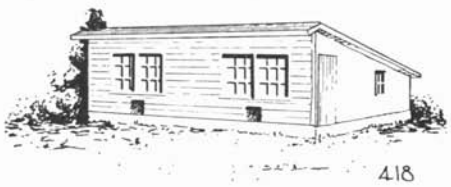
Laying houses. Laying houses for farm-size flocks may be either uninsulated, partly insulated with a straw loft and ventilated attic, or tightly built, fully insulated houses with controlled ventilation.

The straw-loft house is commonly recommended for Illinois. The straw fill lets moisture out and permits air to circulate. With ventilated space above the straw and with adjustable windows, ventilation is reasonably good and a special ventilating system is not needed. In the coldest parts of Illinois, fully insulated houses with ventilating systems will maintain better conditions inside, but they are more expensive. Uninsulated houses are built with only one layer of wood or other material for siding and have a low roof without a loft. They are generally used in the southern part of Illinois.

Laying houses are planned on the basis of about 3 to 4 square feet of floor area per bird, depending on the breed. Less space results in overcrowding. A house 20 feet square will take care of 100 to 135 hens and is sometimes called a unit house.

Equipment. When considering the equipment for a laying house, it is well to plan for:

- 8 to 10 inches of roosting space per bird
- one open nest for each 5 or 6 hens or one trap nest for each 3 or 4 hens
- about 1 foot of mash-hopper feeding space for every 5 hens
- an ample water supply — preferably running water with automatic controls and protection against freezing
- rodent-proof feed storage — metal cans or barrels, or in a large house a separate feed room
- two 40- to 60-watt lights with reflectors over the feed hoppers for each 20-foot length of pen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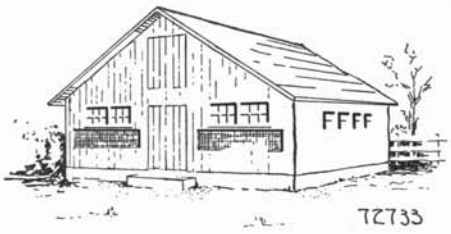

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PLANS FOR POULTRY HOUSES

STRAW-LOFT HOUSE. Plan 404 (*30¢*). Gable roof; 20 x 40 feet for 200 hens, two units. Vary length to get desired capacity. Described in Circular 525, which will be sent free on request. (*Opposite page*)

SHED ROOF. Plan 418 (*30¢*). 20 x 20 feet for 100 hens. Extend length for larger flocks. (*Upper left*)

"MISSOURI" TYPE. Gable roof. Square shape.

Plan 72731 (*30¢*). 30 x 30 feet for 225 hens.

Plan 72732 (*30¢*). 40 x 40 feet for 400 hens.

Plan 72733 (*15¢*). 20 x 20 feet for 100 hens. (*Upper center*)

Plan 72734 (*15¢*). 24 x 24 feet for 150 hens.

TWO-STORY HOUSE. Plan 72751 (*75¢*). When made 26 x 100 feet, provides nine units, each 20 x 26 feet. (*Top right*)

BROODER HOUSE. Plan 56 (*15¢*). Shed roof; movable. When built 10 x 12 feet, will accommodate 250 baby chicks. (*Right*)

BROODER HOUSE convertible to grain bin. Plan 72711 (*15¢*). Movable, 8 x 12 feet. Grain bin has capacity of 500 bushels.

SMALL HOUSE. Plan 297 (*15¢*). Gable roof; 12 x 12 feet. Suitable for about 36 hens, or may be used as a brooder house for 300 chicks. (*Right*)

MULTIPLE-PURPOSE POULTRY SHELTER. Plan 417 (*15¢*). 10 x 12 feet, lightweight, movable, frame-and-screen construction. Described in Circular 552, which will be sent free on request. (*Right*)


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POULTRY EQUIPMENT PLANS

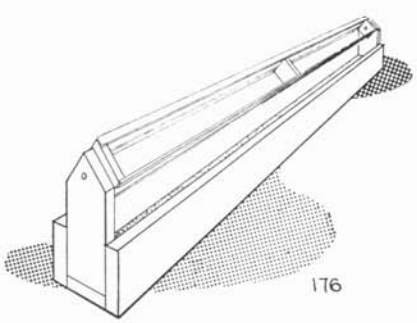
CHICK MASH FEEDERS. Plan 176 (*15¢*). Construction details for starting, secondary, and finishing feeders. (*Lower left*)

POULTRY MASH FEEDERS. Plan 414 (*15¢*). Inside stand and outdoor hopper types. (*Lower center*)

SELF-FEEDER. Plan 77713 (*15¢*). Covered hopper.

WOODEN NESTS. Plan 172 (*15¢*). (*Lower right*)


417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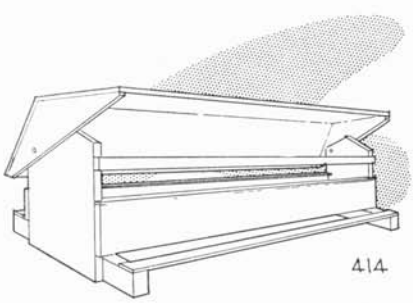
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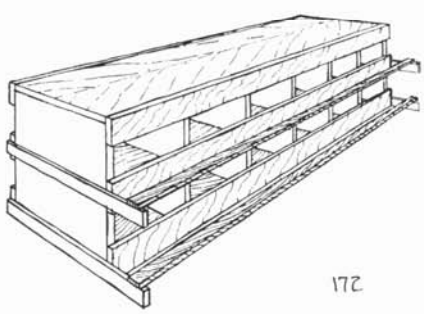
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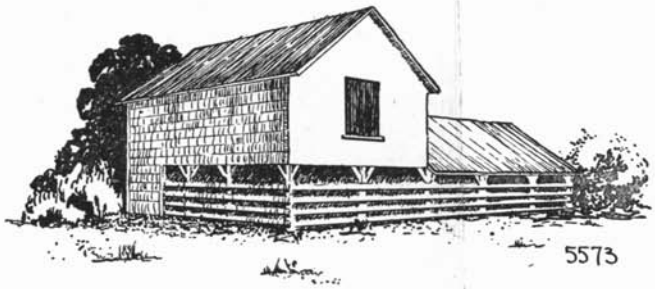
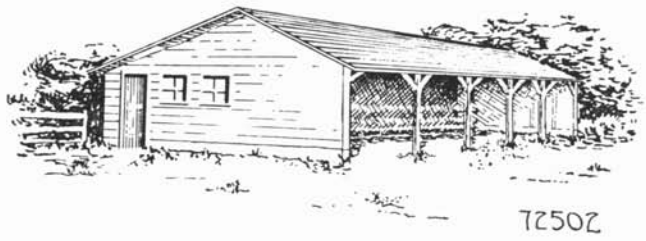
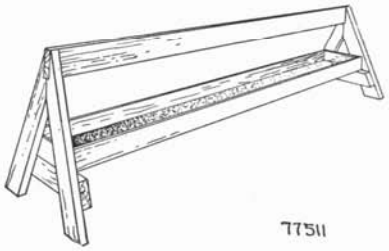
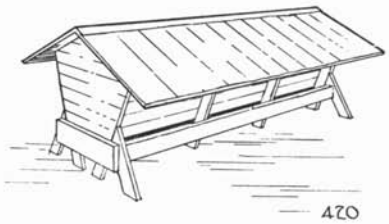
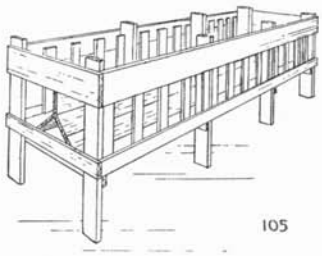
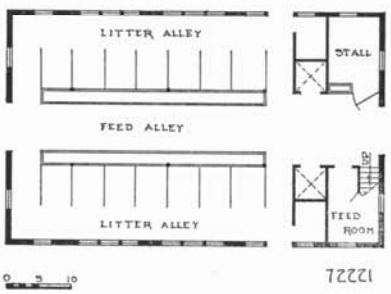


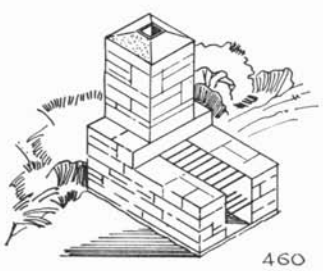


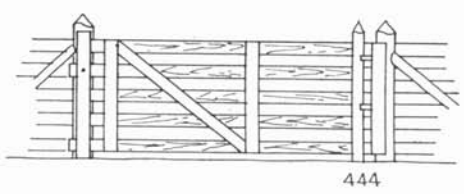












SHEEP BARNS AND EQUIPMENT

SHEEP BARN. Plan 5573 (*30¢*). Has a two-story, gable-roof section, 20 x 32 feet, with space for grain and hay storage, and either one or two 1-story gable-roof wings 24 feet wide. (*Top left*)

SHEEP SHED. Plan 72502 (*30¢*). Gable roof, open front; 22 feet wide, length variable in 7-foot units. (*Top right*)

SHEEP SHED. Plan 261 (*15¢*). Half monitor roof, open front; 21 feet wide, length variable in 12-foot units.

FEED TROUGH for grain. Plan 77511 (*15¢*). 12-inch trough, 8 feet long. (*Left*)

GRAIN SELF-FEEDER. Plan 420 (*15¢*). Covered hopper. Length variable in 4-foot units. (*Left*)

RACK AND TROUGH. Plan 105 (*15¢*). For feeding hay and grain. 3 feet wide, length variable in 4-foot units. (*Left*)

HORSE BARN AND STALLS

HORSE BARN. Plan 72221 (*45¢*). Two stories, gambrel roof. Suitable for riding stable or any other stable for horses. Space for 14 stalls and feed and hay storage. (*Left*)

HORSE STALL. Plan 5175 (*15¢*). Details for three arrangements: face in, face out, and stall next to wall. (*Lower left*)

MISCELLANEOUS

OUTDOOR TOILET. Plan 378 (*15¢*). Wood construction.

OUTDOOR FIREPLACE. Plan 460 (*15¢*). Three types: masonry fireplace with chimney, medium-sized masonry fireplace, low-cost loose-stone fireplace. (*Lower center*)

WOODEN GATES AND FENCES. Plan 444 (*15¢*). Seven types of gates, fences, and passages. (*Lower right*)

PLANNING THE FARMSTEAD

Planning of farm buildings should begin with a study of the farmstead so that each new building can be located to best advantage and the arrangement of buildings, driveway, yards, and plantings can be effective and attractive. A long-time plan is needed as a guide. Each improvement as it is added can then be located to fit into the long-time plan.

The general principles of farm planning are the same for most farmsteads even though the details vary because of differences between farms. The following suggestions apply to most farmsteads in Illinois.

Locate each new building on elevated ground so that surface water will drain away from it. If necessary, build the floor above the ground line and grade the ground to get the right slope.

Try to group buildings according to the production program; place animal shelters, hay storage, grain and feed supplies, and feeding floors or milk rooms in compact, labor-saving units. Keep machinery-storage and shop buildings away from barns to minimize danger from fire, but place them so it will be easy to get machinery in and out.

Locate a new dwelling 80 to 100 feet from the road with the garage near the house. Poultry buildings may be reasonably close to the house — 100 feet or even less.

Plan a service court or farmyard so that you will not have to go through gates to reach the principal buildings. Make the court large enough for trucks, tractors, and farm machinery to be handled and turned easily. This means the yard should be at least 80 feet across the narrow width.

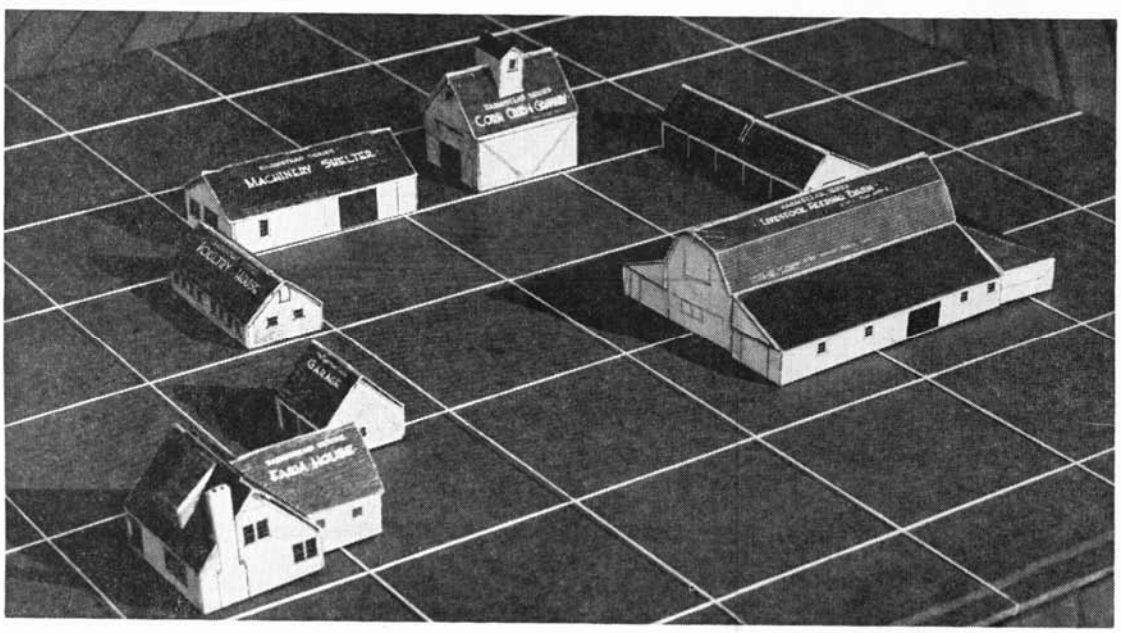
Protect feedlots, pens, and yards by locating them to the south or south and east of the barns and other shelters. This arrangement will cut off cold winds in winter, get as much sunlight as possible in the lots, and reduce the danger of icy yards.

Locate windbreaks north and west of the buildings. Keep the area reasonably open to the south and southwest. Avoid locating hog lots and cattle yards southwest of the dwelling.

Usually provide only one all-weather driveway from the road into the farmstead. Provide space for parking cars. Make it easy to get to the front and back doors of the house, to the garage, and to the farm buildings from the driveway.

Plan for water supply and electric service to all principal buildings and for septic-tank sewage disposal from the dwelling.

The farm-building models can be used to study farmstead arrangement and location of buildings. They are printed in two colors, cut, and creased for folding. The set of seven models, Plan 459, costs 60¢. Plan 458 shows a scaled layout for farmstead planning with flat cutouts of the principal buildings and sells for 15¢.



PUBLICATIONS BY THE U. S. DEPARTMENT OF AGRICULTURE

A number of publications dealing with farm houses and other farm structures are available from the U. S. Department of Agriculture. Some that are likely to be of interest to midwestern farmers are listed below. Many of these are free; for a few there is a small charge to cover printing costs.

When ordering any of these, give series, number, and title of publication. The series is indicated by the letter coming before the number; in the following list F means Farmers' Bulletin, C means Circular, and M means Miscellaneous Publication.

FREE PUBLICATIONS

Single copies of the following publications are sent free as long as the supply for free distribution lasts. If the free supply is exhausted and they are not available from some other source, they can usually be obtained at cost from the Government Printing Office, Washington 25, D. C. As many as 10 different publications may be ordered by any one person.

Send orders for free publications to Division of Publications, Office of Information, U. S. Department of Agriculture, Washington 25, D. C.

Farm housing

F 1132 Planning the Farmstead
F 1426 Farm Plumbing
F 1572 Making Cellars Dry
F 1749 Modernizing Farm Houses
F 1865 Closets and Storage Spaces
F 1889 Fireplaces and Chimneys
F 1950 Sewage and Garbage Disposal on the Farm
F 1978 Safe Water Supply for the Farm
F 1993 Decay and Termite Damage in Houses
M 358 Use and Abuse of Wood in House Construction
C 406 Oil Burners for Home Heating

Farm buildings, materials, and equipment

F 810 Equipment for Farm Sheep Raising
F 1487 Practical Hog Houses
F 1490 Hog-Lot Equipment
F 1554 Poultry Houses and Fixtures
F 1660 Use of Logs and Poles in Farm Construction
F 1678 Safe Use and Storage of Gasoline and Kerosene on the Farm
F 1751 Roof Coverings for Farm Buildings
F 1756 Selection of Lumber
F 1772 Use of Concrete on the Farm
F 1818 Mechanical Milk Cooling on Farms
F 1820 Silos: Types and Construction
F 1832 Farm Fences
F 1869 Foundations for Farm Buildings
F 1907 Equipment and Methods for Harvesting Farm Woodland Products
F 1911 Preventing Damage to Buildings by Subterranean Termites and Their Control
F 1975 Farm Buildings From Home-Grown Timber in the South
F 1976 Handling and Storing Soft Corn on the Farm
F 2009 Storage of Small Grains and Shelled Corn
F 2010 Storage of Ear Corn on the Farm
C 683 Effectiveness of Wood Preservatives in Preventing Attack by Termites
M 579 Building With Logs
M 629 Wood Properties and Paint Durability

A CHARGE IS MADE FOR THE FOLLOWING PUBLICATIONS

Send check, money order, or postal note with your order to Superintendent of Documents, Government Printing Office, Washington 25, D. C. *Do not send stamps.*

Farm housing

F 1460 Simple Plumbing Repairs in the Home (5¢)
F 1738 Farmhouse Plans (15¢)
M 619 Your Farmhouse . . . How to Plan Remodeling (15¢)
M 622 Your Farmhouse . . . Cut-Outs to Help in Planning (25¢)
M 633 Your Farmhouse . . . Insulation and Weatherproofing (10¢)
M 638 Your Farmhouse . . . Planning the Bathroom (10¢)
M 646 A Step-Saving U Kitchen (10¢)

Farm buildings, materials, and equipment

F 1500 Rammed Earth Walls for Buildings (10¢)
F 1584 Feedlot and Ranch Equipment for Beef Cattle (5¢)
F 1643 Fire Safeguards for the Farm (10¢)
C 701 Hog-Housing Requirements (5¢)
C 722 Functional Requirements in Designing Dairy Barns (10¢)
C 738 Functional Requirements in Designing Laying Houses for Poultry (5¢)

PUBLICATIONS BY THE UNIVERSITY OF ILLINOIS COLLEGE OF AGRICULTURE

Constant investigation, design, and planning are necessary for the improvement of farm buildings and farmhouses. The Department of Agricultural Engineering carries on research in a wide variety of subjects connected with farm buildings and rural housing. Results of this research appear in various Illinois publications. Some of the subjects studied are:

Requirements for efficient housing or storing of crops and livestock. Results of these studies show up as new designs and recommendations.

New methods of construction. Observations and tests show whether they are suitable for certain types of farm buildings.

New building materials. As they come on the market, their use for farm buildings is studied. Often they are tested under farm conditions.

How building arrangement affects labor requirements. The amount of labor it takes to do jobs around the farmstead is measured for different building arrangements in an effort to find the most efficient arrangement.

Requirements for farm housing. The space, arrangements, utilities, and equipment necessary for satisfactory accommodations for farm-family living are being studied.

Much of the research conducted by the Department of Agricultural Engineering is in cooperation with other departments, other state experiment stations, and with the U. S. Department of Agriculture. This cooperation permits more thorough study of a problem than would otherwise be possible.

Answers to many questions about farm building can be found in these Illinois publications.

Barns

Beef Cattle Housing. Regional Publication No. 6.

Dairy Cattle Housing. Regional Publication No. 7.

Beef Cattle Feeding Study. AEng. 550.

Crop Storage

Harvesting and Storing Soybeans. Circular 529.

Harvesting and Storing Chopped Hay. AEng. 230.

Silo Capacity Table. AEng. 372.

Temporary or Emergency Silos. AEng. 400.

Barn Hay Curing Systems. AEng. 462.

Drying Corn in Cribs. AEng. 545.

Handling, Storing, and Feeding Soft Corn. AEng. 546.

Plan for Pole and Snowfence Crib. Sheet 447.

Plan for Circular Corn Crib of Native Lumber. Sheet 495.

Hog Housing

Labor-Saving Hog Equipment. Circular 554.

Self-Feeders for Hogs. Circular 562.

Poultry Housing

Straw-Loft Poultry House. Circular 525.

All-Purpose Poultry Shelter. Circular 552.

Electric-Lamp Chick Brooder. AEng. 351.

Farm Housing

When You Build or Remodel Your Farmhouse. Circular 620 (Regional Publication No. 8).

A Basic Farmhouse Plan. Circular C7.2.

Septic-Tank Systems. Circular G5.5.

Housing Seasonal Farm Workers. FL 151.

Other

Planning the Illinois Farmstead. FL 119.

Galvanized Roofing for Farm Buildings. Circular 624.

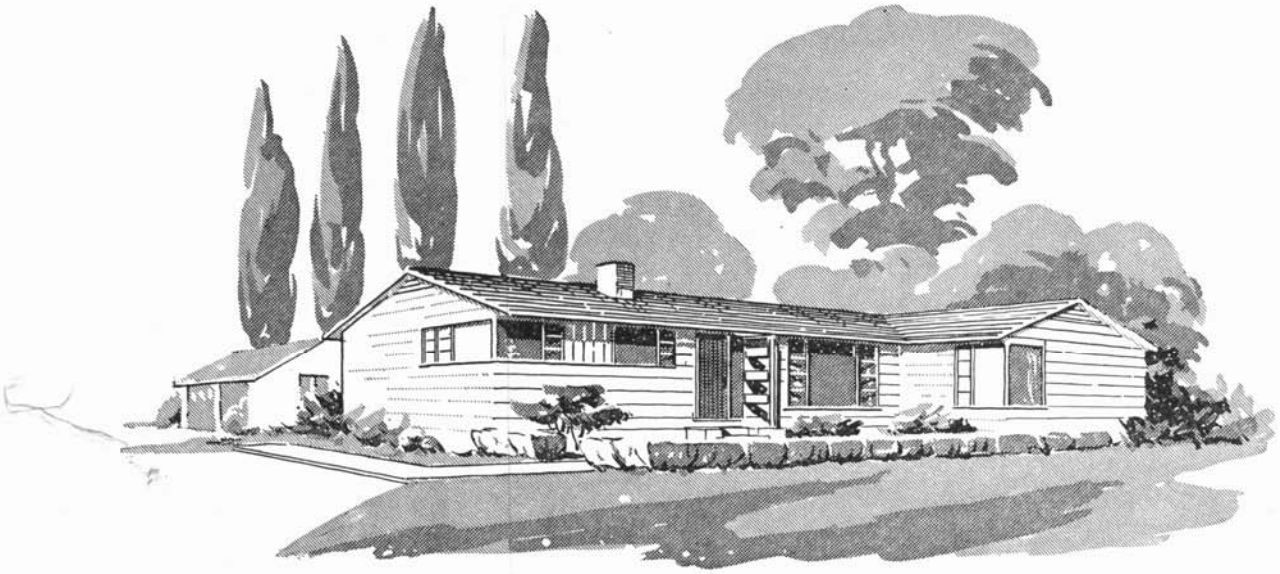
Whitewash Formulas. AEng. 367.

Preserve Your Posts With Penta. Circular 636.

Winter Vegetable Storage. Circular 530. (Has a description of a basement storeroom.)

To obtain any of these publications, write to the DEPARTMENT OF AGRICULTURAL ENGINEERING, UNIVERSITY OF ILLINOIS, COLLEGE OF AGRICULTURE, URBANA. They are free on request.

Address all inquiries about farm buildings and housing or other agricultural-engineering subjects to the Department of Agricultural Engineering. Questions about other farm problems may be directed to the INFORMATION OFFICE, UNIVERSITY OF ILLINOIS, COLLEGE OF AGRICULTURE, URBANA, or to the Department concerned. Or you can get help from the farm or home adviser in your county. Each has up-to-date information and many plans and publications of timely interest.



FARMHOUSES

Farmhouse planning. The University of Illinois College of Agriculture distributes house plans in addition to distributing farm service-building plans. Many of the house plans were developed cooperatively with the other colleges of agriculture in the North-Central region and with the U. S. Department of Agriculture. A list of available house plans will be sent on request.

Circular 620, "When You Build or Remodel Your Farmhouse," will help your planning before starting to build. It is free on request.

The farmhouse pictured above is Plan 480, described as "a basic farmhouse plan." It has six rooms — utility, kitchen, living-dining, and three bedrooms. This plan embodies such modern features as: (1) choice of basement or extended utility space on the ground floor, (2) simplified construction, (3) all rooms on one floor, (4) a highly adaptable plan which can be changed in size, length, use of rooms, construction material, or the way it faces on the public road. The plan, designed by the College of Agriculture and the Small Homes Council, is more fully described in Circular C7.2, "A Basic Farmhouse Plan." It is free on request. Complete blueprints of Plan 480, as well as other plans for farmhouses, cost $1.00 a set.

Farmhouse remodeling. Often remodeling an old house is the best way to obtain better housing and at the same time save money and salvage the values of the old house. Several sketch plans have been prepared to show how farm families in Illinois have made improvements by modernizing the kitchen, adding a bathroom, building fire-safe flues and better stairways, putting in closets, and changing the outside appearance of the house. A selection of blueprints showing how ten houses were remodeled may be obtained for $1.50. Circular 620 will also be found helpful when remodeling.

The Small Homes Council. This University of Illinois organization, in addition to its other activities, publishes a series of circulars of interest to homeowners whether on the farm or in town. The list below includes publications through Fall, 1950. *Orders for the circulars should be sent to the Small Homes Council, Mumford House, University of Illinois, Urbana.* Single copies of back issues of the series can be purchased for 10¢ each — or the complete set of all 25 circulars can be had for $2.50. With the purchase of the set of circulars, your name will be added to the mailing list to receive future issues free of charge.

A1.3 Financing the Home
A2.0 Business Dealings With Architect and Contractor
B1.1 Livable Neighborhood
B2.1 Selecting the Home Site
B3.0 Land Design
C2.1 Designing the Home
C3.2 Solar Orientation
C5.3 Planning the Kitchen
C5.31 Cabinet Space for the Kitchen
C5.32 Kitchen Planning Standards
C7.2 A Basic Farmhouse Plan
E2.1 Construction Methods
F4.3 Concrete Floors (slab)
F6.0 Insulation
F6.2 Moisture Condensation
F7.0 Chimneys and Fireplaces
F11.2 Storm Sash
F15.0 Hardware
G3.1 Heating the Home
G3.5 Fuels and Burners
G3.61 Homes Planned for Coal or Coke
G4.0 Electricity
G5.0 Plumbing
G5.5 Septic-Tank Systems
H1.0 Interior Decoration

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