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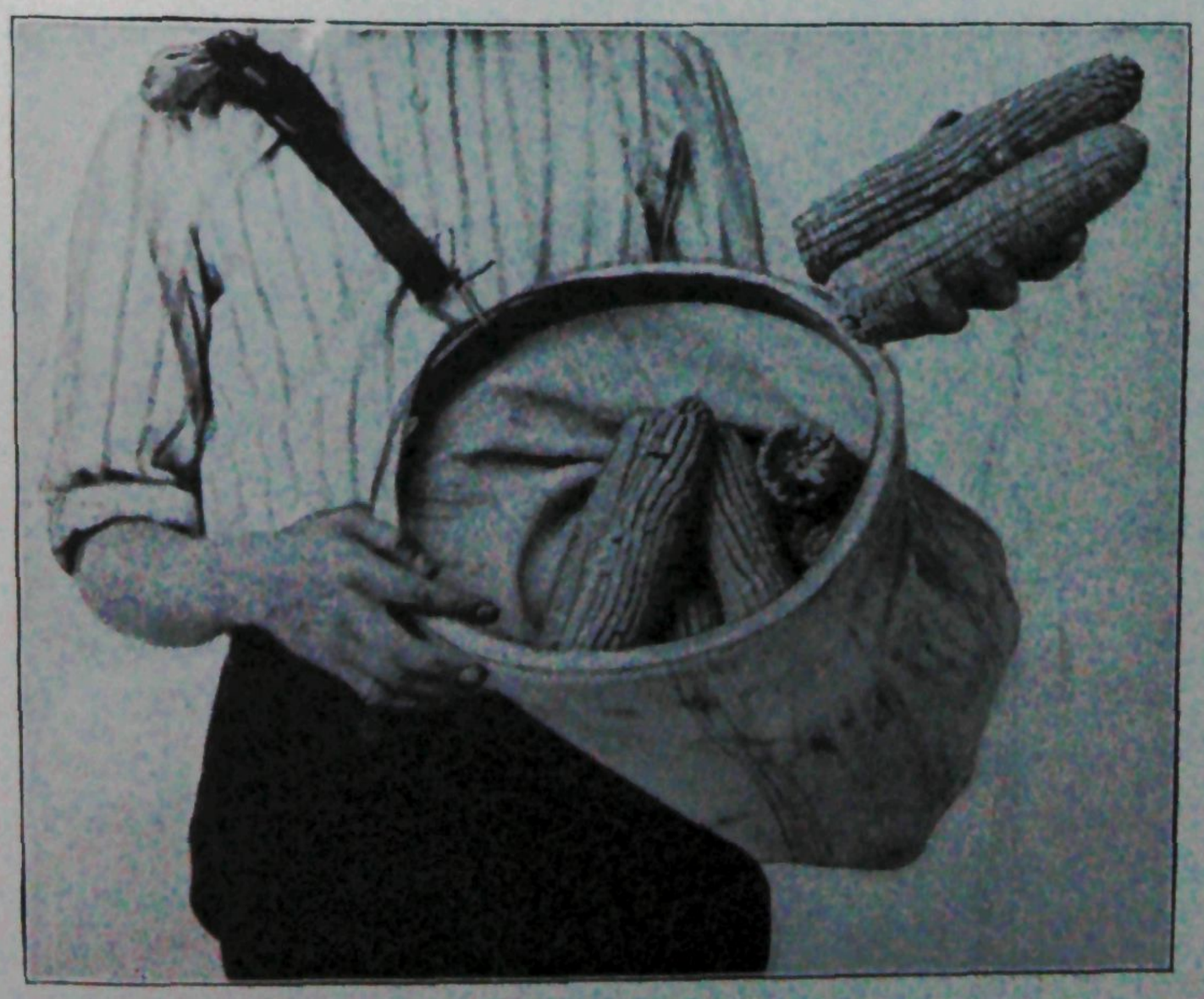
SELECTION AND STORAGE OF SEED CORN

By W. L. BURLISON and E. A. WHITE



No Time is Wasted When a Hoop is Placed in the Top of the Sack Used for Gathering Seed

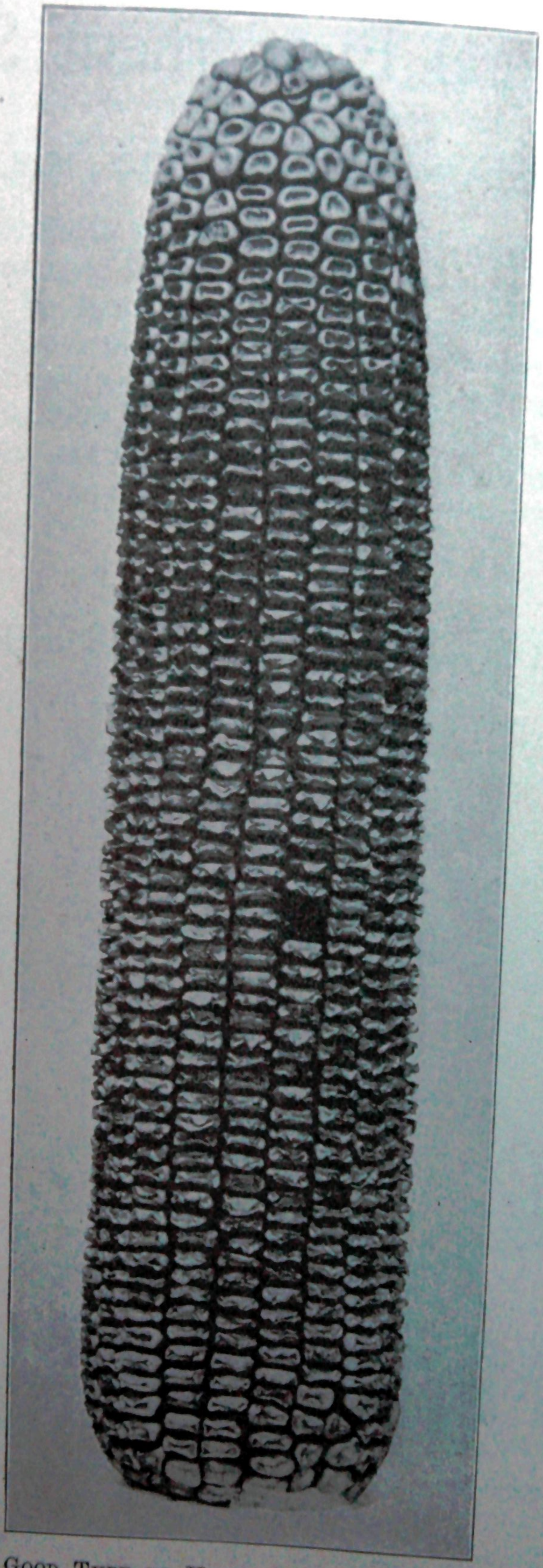


FIG. 1.—THIS IS A GOOD TYPE TO KEEP IN MIND WHEN SELECTING SEED CORN

SELECTION AND STORAGE OF SEED CORN

By W. L. Burlison, Associate Chief in Crop Production, and
E. A. White, Assistant Professor in Farm Mechanics

Illinois has passed thru a seed-corn crisis. The seed-corn situation for 1918 will be recorded as the most serious in the history of corn-growing America.

The northern part of Illinois produced practically no seed corn. Central Illinois saved a small amount of good seed, but not even enough for its own use. Great quantities of corn had to be moved from southern counties of the state and many nearby sections of Indiana and Missouri, in order to supply the demand created by the lack of seed corn in northern Illinois. This meant that seed grown in localities with rather long seasons had to be used in localities of shorter seasons. All this contains an element of danger, and in order to eliminate so far as possible late maturing seed for the 1919 planting, strong emphasis must be placed on the *early selection of a full supply of seed this fall.*

If the supply is to be sufficient for next year, two facts are to be kept clearly in mind:

1. Seed corn must be selected early, and from the field.
2. It must be properly stored.

WHEN AND HOW TO SELECT SEED CORN

Select seed corn before the first killing frost. For the extreme northern part of the state, October 12 is the average date for the first killing frost; for the central-northern, October 15; for the central, October 16; for the central-southern, October 20; and for the extreme southern, October 24. However, general killing frosts sometimes occur three weeks earlier than these dates, so that seed-corn week should begin September 15 for northern Illinois, September 20 for the central district, and September 25 for the southern third of the state. *Let each community proclaim a "seed-corn week" to begin with the date mentioned for the district.*

If corn is allowed to remain in the field during cold, moist weather, the germination and vitality will be greatly diminished, if not entirely lost. The moisture content of corn is often 30 percent or more when the seed is ready to pick. If freezing weather catches the seed ears when they contain a relatively high percentage of water, the corn is likely to be of no value for seed purposes.

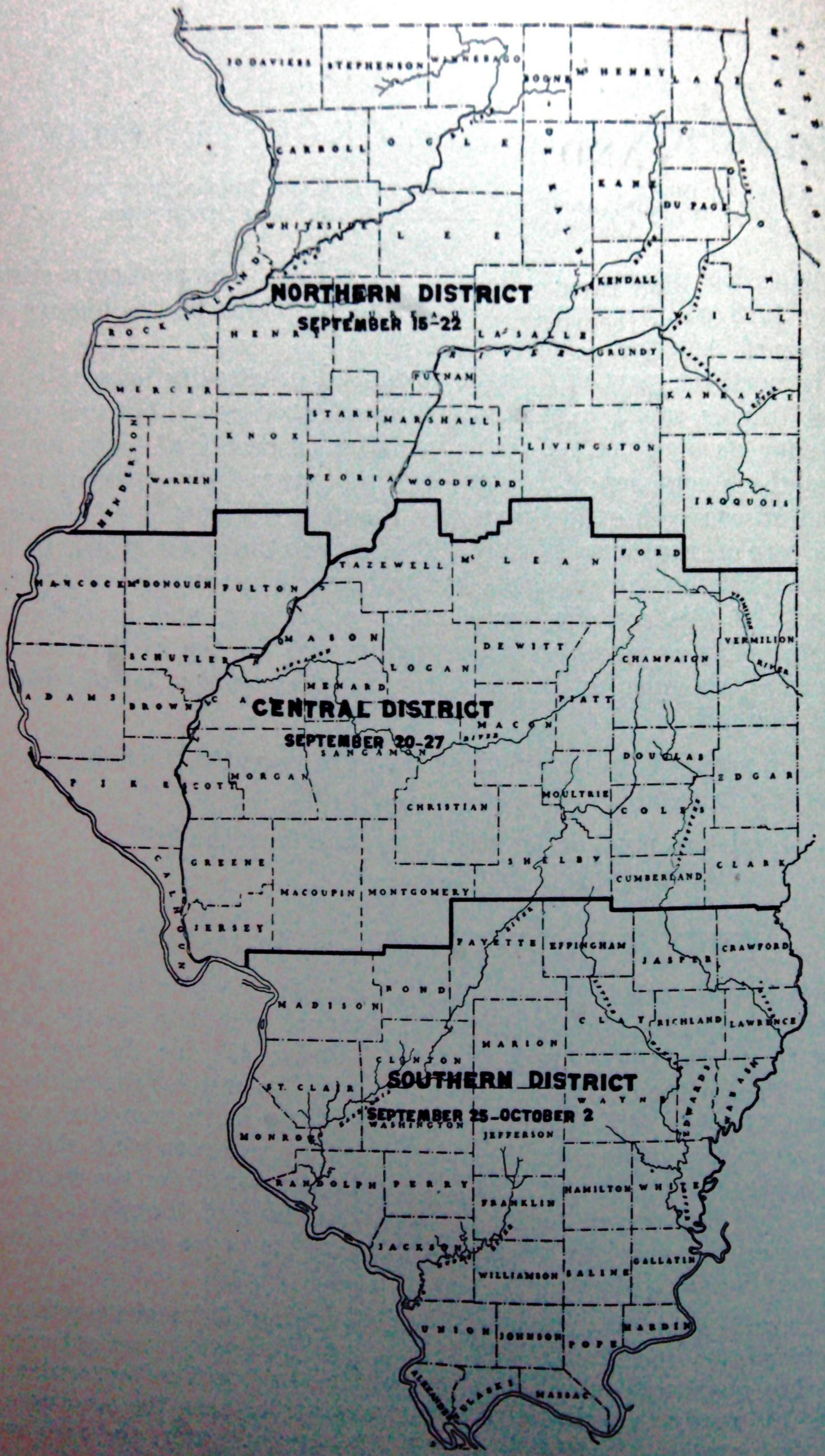


FIG. 2.—WHY NOT HAVE A SEED-CORN WEEK FOR EACH OF THESE DISTRICTS?

The following points should be observed in selecting seed corn from the field:

1. Ears of medium size only should be chosen.
2. The grains should be well dented (corn will make satisfactory seed as soon as the grains are well dented).
3. The ears should be of good shape, but early maturity must not be sacrificed for fancy points.
4. Ears should be chosen which hang down, because they shed water.
5. The shank should be of medium length and diameter.
6. There should be two good stalks in the hill from which a seed ear is taken.

Let the state have a seed-corn reserve. Select sufficient seed for two years. This will not cost much as compared to what it might mean to Illinois. It is a standard insurance against the recurrence of the near disaster of 1917-1918.

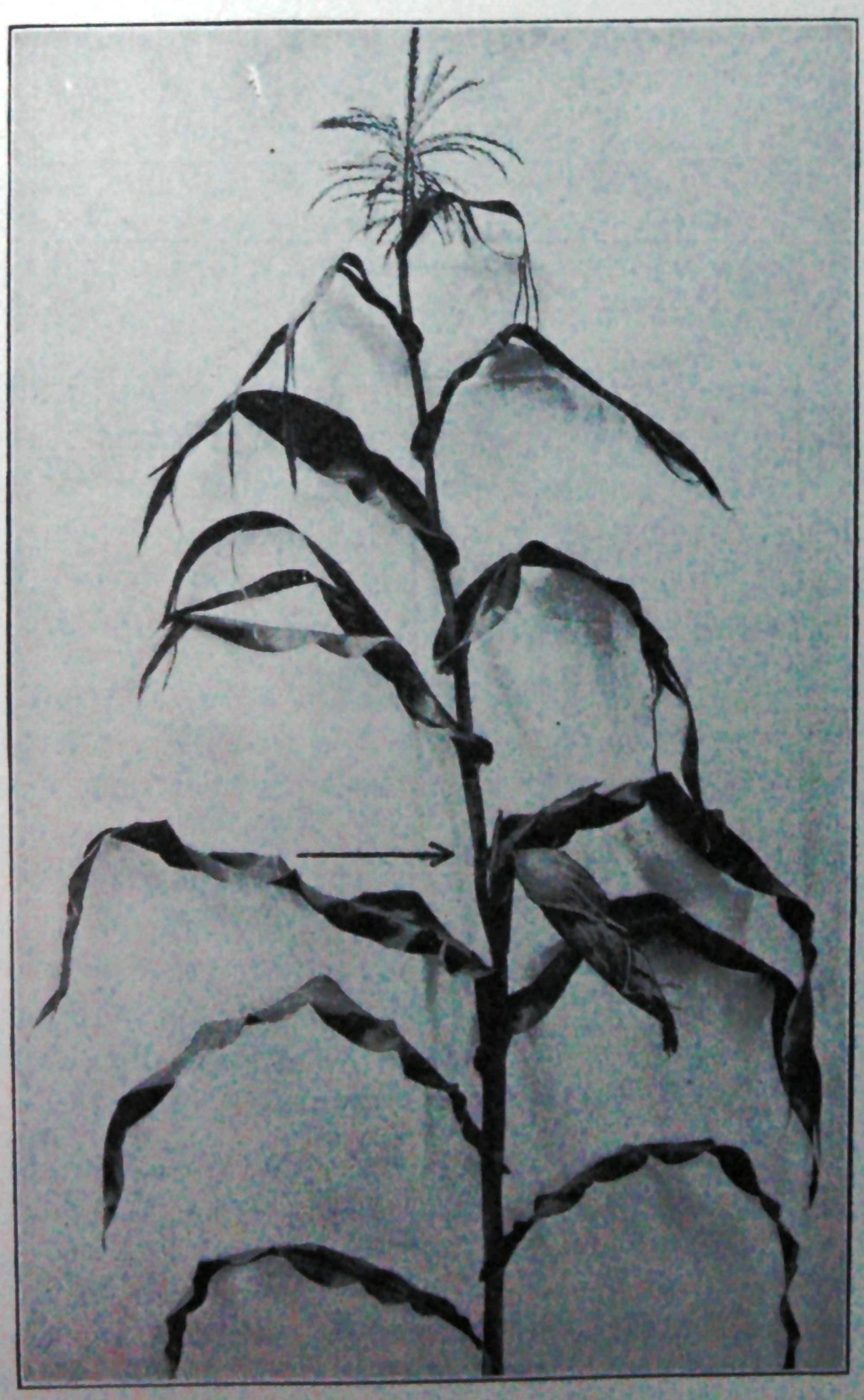


FIG. 3.—THE EAR ON THIS STALK HAS THE RIGHT ANGLE

MOISTURE CONTENT AND GERMINATION OF CORN HARVESTED AT VARIOUS DATES DURING FALL AND WINTER OF 1917-1918

From Nebraska Experiment Station Bulletin 163

Condition of corn at time of first frost, October 8	Moisture and germination of corn gathered on—					
	October 8[1]		November 19		January 17	
	Moisture	Germination	Moisture	Germination	Moisture	Germination
	percent	*percent*	*percent*	*percent*	*percent*	*percent*
Shocked corn:						
1. Fairly well matured, ears solid	30	98	17	85	14	86
Corn standing in field:						
2. Fairly well matured, ears solid	35	98	17	83	14	88
3. Somewhat rubbery, ears twist	39	94	21	56	17	61
4. Very rubbery, grain medium soft	43	92	26	34	19	20
5. Grain very soft	47	92	27	14	22	6
6. Late dough stage	50	82	34	10	27	0
7. Milk stage	63	44	36	1	28	0
Minimum temperature, degrees F.	..	24	..	17	..	-21

[1]The first selection was made after the first killing frost which occurred in the early morning of October 8.

It will be noticed from the accompanying table that the germination test of the corn gathered early was satisfactory in every case except when gathered in the milk stage. The moisture content, however, of corn gathered early is high, and this necessitates care in handling the seed ears. Additional data in the Nebraska bulletin from which the above figures are taken show that in nearly every case seed selected after October 8 fell in germination test.

STORAGE OF SEED

The chief problems in storing seed corn are to provide a means whereby the moisture content can be reduced to such a point that the germ is not injured by freezing, and then to maintain this condition until planting time. The minor problems are to afford protection against the ravages of vermin, to reduce the work of storage, and to have the ears so placed that they are accessible when the germination test is made.

The two prime necessities for successful seed storage are ventilation and heat. Ventilation provides a means for removing the excess moisture. Heat prevents freezing and hastens the drying process. In many years proper ventilation is all that is required. However, some artificial means for heating should be provided in case it is needed. Kiln-dried corn possesses strong germination usually. The seed ears should be dried in a room having a temperature not above 110 degrees. Corn containing less than 14 percent of moisture is not easily injured by cold weather, but seed containing more moisture should not be exposed to freezing temperature.

The Wisconsin Experiment Station has reported some very definite facts in this connection. In tests by that station corn kept in a warm, dry room or attic, gave a germination test of 98 to 100 percent; corn well dried before freezing germinated as well; when the seed was left in the shock or in the open crib during the winter months, the germination and vitality were so low that the product was unfit for seed.

A large amount of the trouble experienced with seed corn in 1917-18 could have been prevented by heating the storage rooms, if no more than just enough to prevent freezing. The protection against vermin can generally be secured by using a form of construction which offers no harbors for mice and rats; or, if this is not sufficient, wire netting can be used to line the seed room. The presence of cats also helps to reduce this trouble.

Seed corn should never be stored in sacks, piles, or even by placing one row of ears immediately on top of another. The individual-ear method of storage is the only safe one to use, at least until the moisture content has been reduced to 18 percent or lower. This method of storage facilitates ventilation, which hastens the drying process, tends to prevent molding, and lessens the trouble caused by mice and rats.

SYSTEMS OF STORAGE

There are several systems that have given excellent satisfaction for the individual-ear method of storage. No matter what method is used, seed corn should be stored at least one foot off the floor, and for convenience it should not be placed over seven feet above the floor.

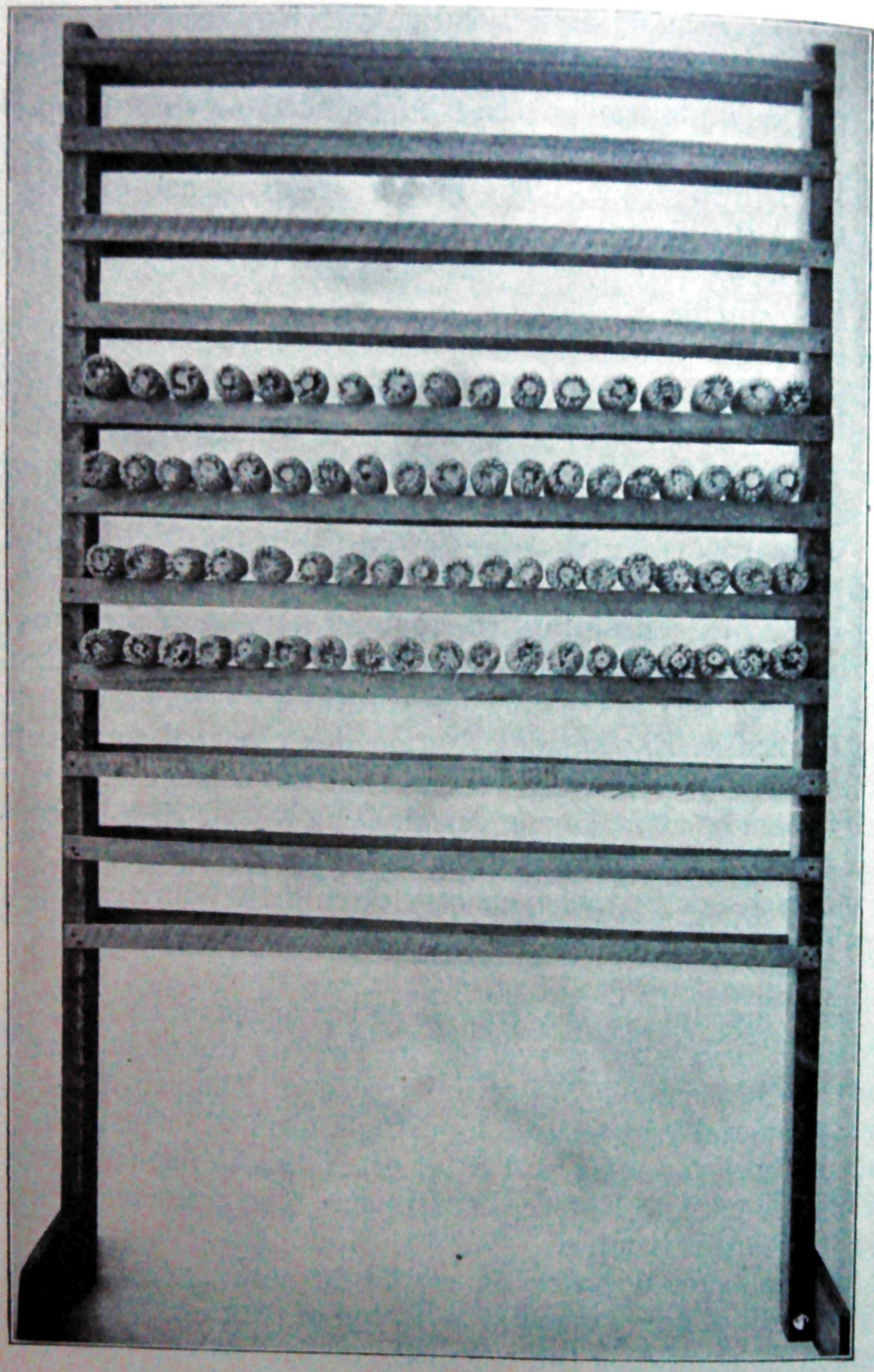


FIG. 4.—LATH RACK SYSTEM, A FAVORITE METHOD OF STORAGE
The ears need not be removed until after the germination test.

Lath-Rack System.—The lath-rack system is shown in Fig. 4. By placing two sets of racks side by side and leaving an alley between the rows of racks, every seed ear will be accessible. There should be a space of at least three inches between the laths. The ends of the racks should be at least 1x6-inch lumber; the footings 2x6-inch lumber, 2 feet long. If desired, these racks may be built as part of the seed house, in which case the footings would not be required.

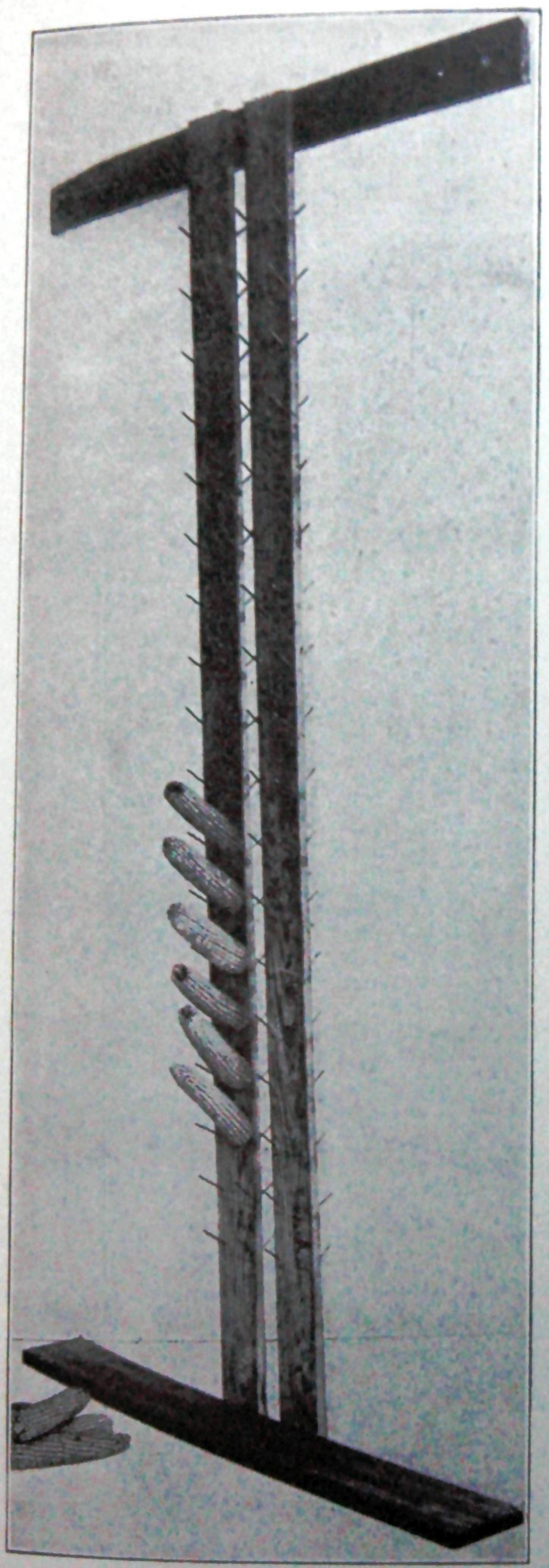


FIG. 5.—NAIL SYSTEM

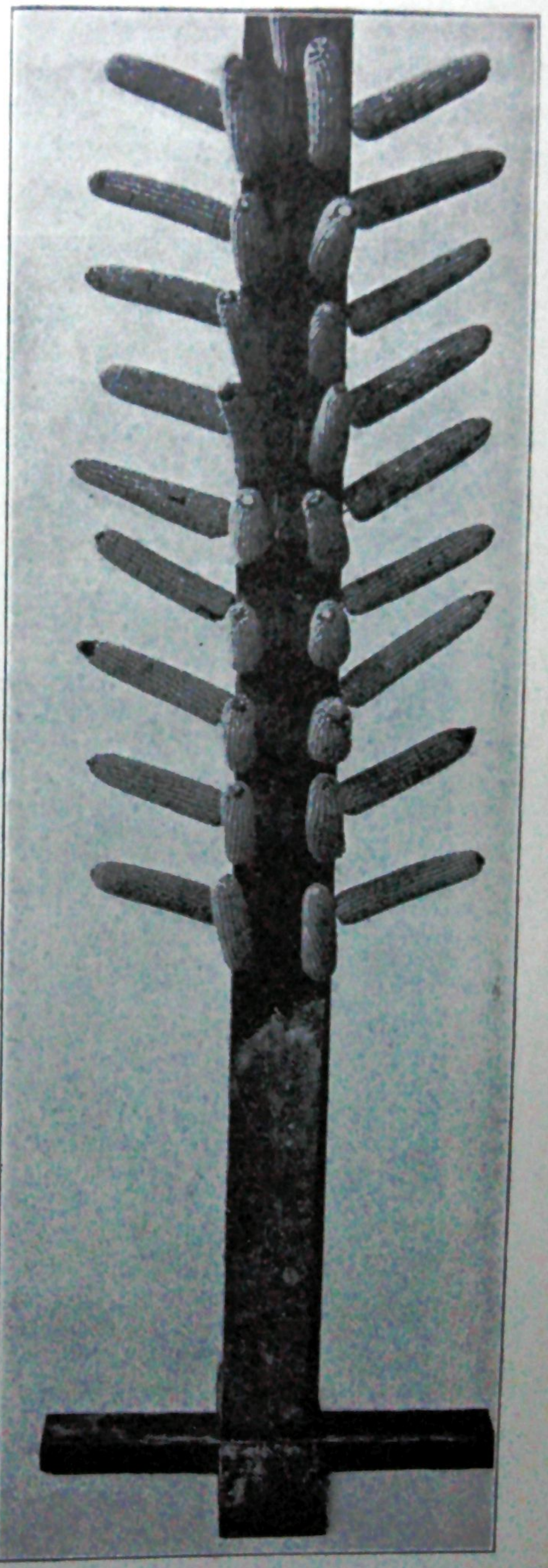


FIG. 6.—POST SYSTEM

Nail System.—The nail system is shown in Fig. 5. Two rows of ten-penny nails, three inches apart, are driven from each side of a 1x4-inch piece of lumber, so that they will make an angle 45 degrees from vertical. The nails are four inches apart in the vertical direction. The 1x4-inch pieces are placed six inches center to center. The rows of racks are placed four feet apart, which allows for alleys.

Post System.—In the post system (Fig. 6), nails from which the heads have been cut are driven into a post, with the same spacing as used in the nail system. Whenever the posts are available, this method is very satisfactory; otherwise it is not to be recommended.

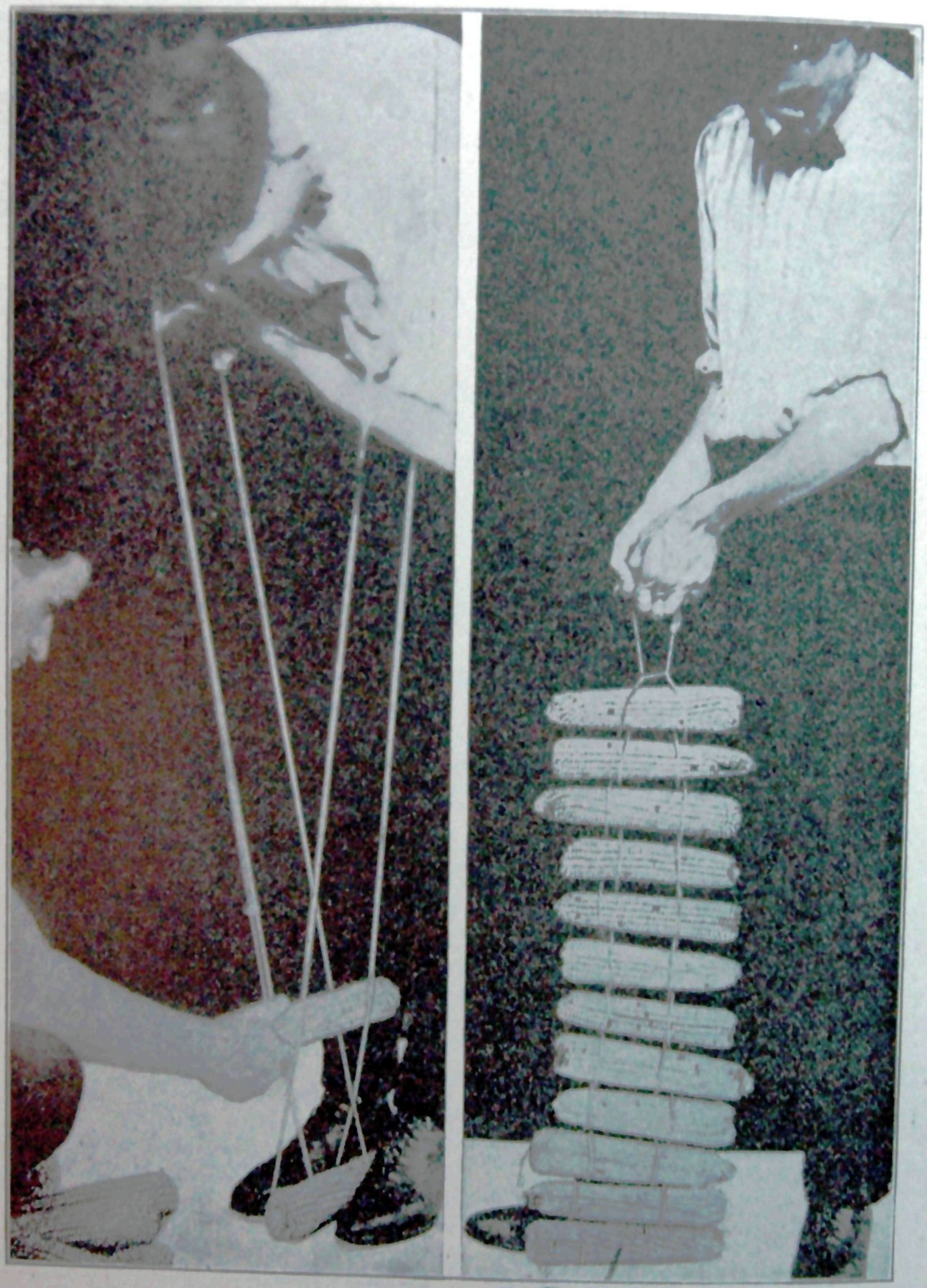


FIG. 7.—TWINE SYSTEM. ONE OF THE COMMON METHODS OF HANGING SEED EARS

By this plan large quantities of corn can be stored in a limited space. The ears are held firmly in place.

Twine System.—The twine system (Fig. 7) requires about one-fourth pound of bundle twine per bushel. The units can be suspended from the rafters or from especially constructed racks. When this system is used, the seed room can be filled from the back forward, leaving no aisles.

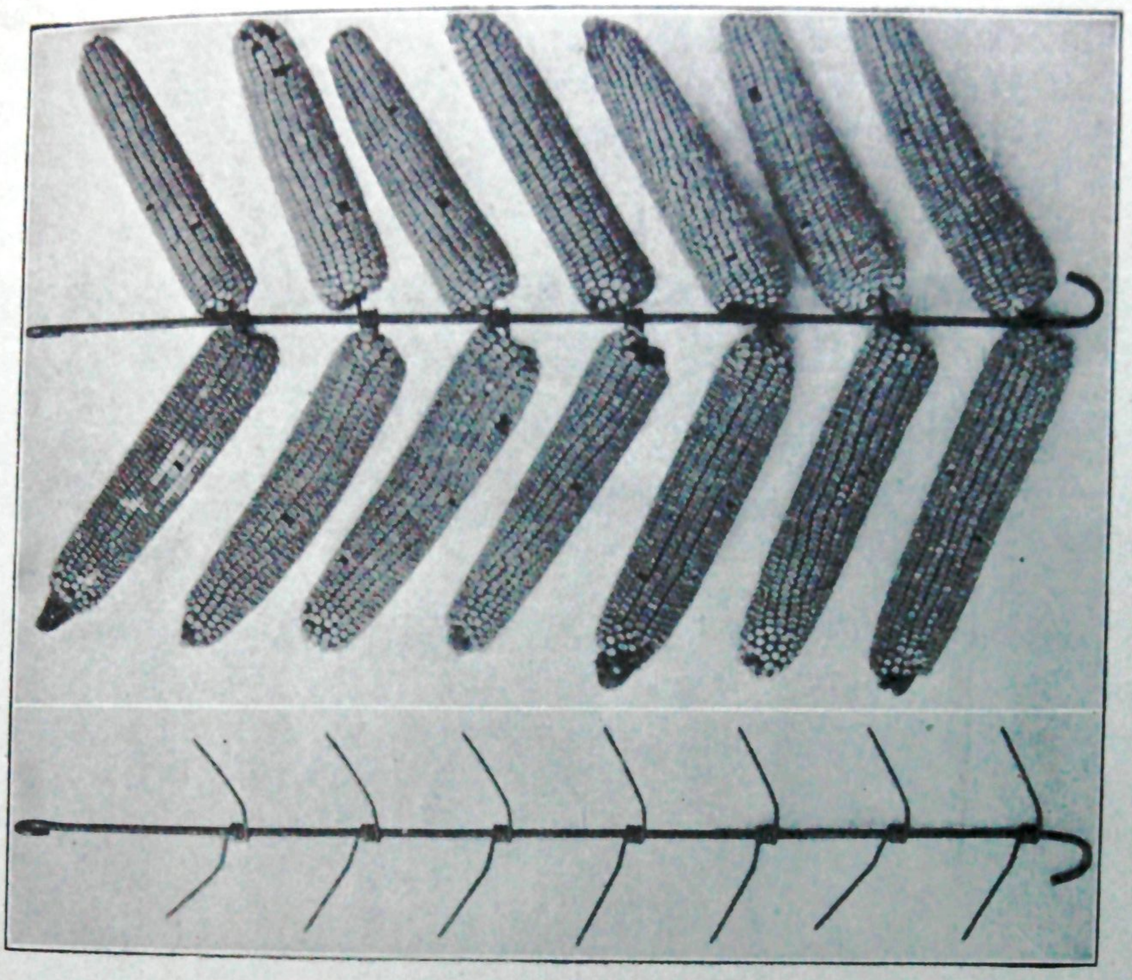


FIG. 9.—PATENT HANGERS ARE SOMETIMES USED

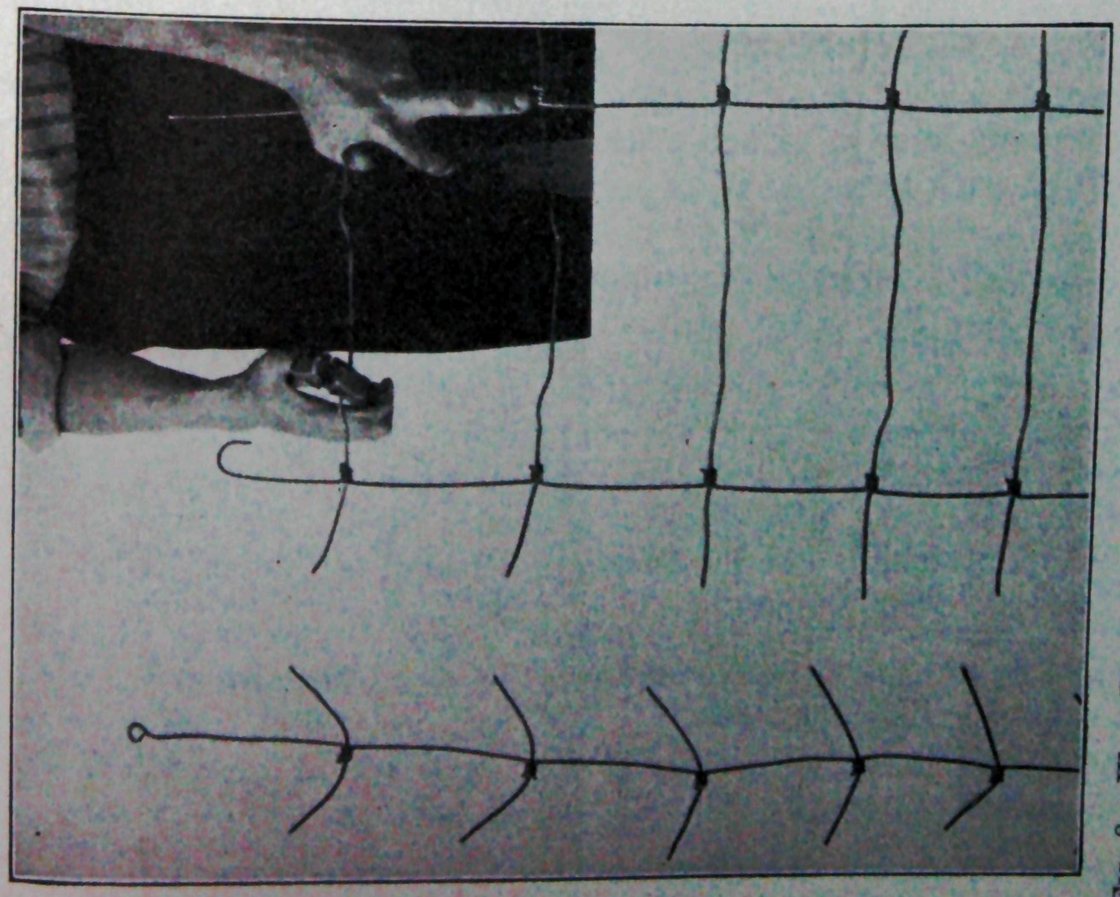


FIG. 8.—WIRE PRONGS MADE OF NO. 9 WIRE ARE JUST AS GOOD AS PATENT KINDS

Wire-Prong System.—The wire-prong system (Fig. 8) is comparable in every respect with the twine system, except for the different method of holding the ears. No. 9 wire, woven or electric-weld, may be used. The patent-prong hanger (Fig. 9) can be purchased on the open market.

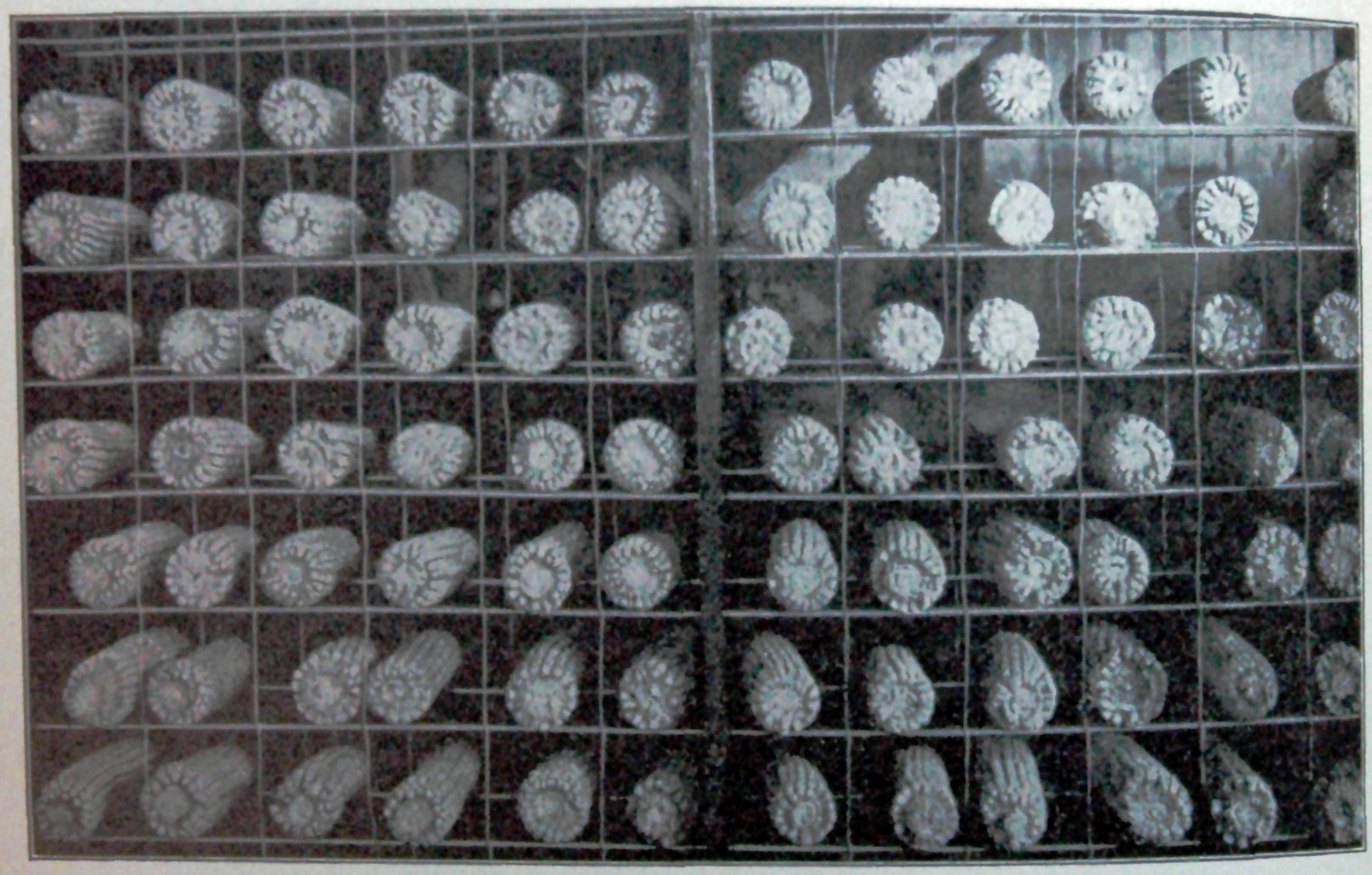


FIG. 10.—WIRE RACK FOR STORING SEED CORN

Wire-Rack System.—The wire-rack system (Fig. 10) has been de veloped commercially. Each rack holds 100 ears. The seed room can be filled with these racks, or alleys may be left, as desired.

SPACE REQUIRED FOR STORAGE

If alleys are left in the storage room, making every ear accessible, approximately 20 cubic feet of space is required for each 100 ears stored; if no alleys are left, approximately 12 cubic feet of space is required. (About 80 to 100 ears make a bushel.) Alleys are necessary if the rack, lath, nail, or post system is used. The twine, prong, or wire-rack system can be used with or without alleys, as desired.

SEED HOUSES

The very common practice of hanging seed ears in corn cribs or other open buildings may secure excellent ventilation, but it offers no protection against freezing. In order to insure a supply of seed in adverse seasons, this method of storage should be discontinued. It is economical but not safe. Under certain conditions seed corn may be stored in a dry basement, but this practice should not be encouraged unless the ventilation is good. Frequently the ventilation of a basement is very poor and the relative humidity of the air high, affording excellent conditions for the growth of mold. There is probably no better place in which to store seed corn than in a well ventilated room in the house, provided this room can be heated. This reduces the danger of freezing to a minimum. There are decided objections, however, to the litter which is certain to result when corn is brought into a dwelling-house. The safest and most desirable arrangement is to have a house built especially for storing seed corn.

In designing a seed-corn house, especial attention must be given to the problems of ventilation and heating. Just so far as possible, advantage should be taken of natural conditions for providing ventilation. The heating of the house will have to be provided for by artificial means. From the standpoint of economy it is desirable to combine the storage room with some other building, as the same foundation and roof will then serve two purposes. The most desirable combination to make will, of course, depend upon local conditions. Work such as washing or butchering, requiring the use of hot water, should not be done in such a house if the steam produced passes into the place used for keeping seed corn.

Fig. 11 illustrates a combined garage and seed house constructed of wood. This building is 16x22 feet. On the first floor there is room for an automobile, a work bench, and a stove. By installing double doors and putting the work bench under the stairway, this building can be used to house two automobiles. The second story will hold from 45 to 90 bushels of seed corn, depending upon the system of storage which is used. Ventilation can be secured by opening the second-story doors. In cold weather these doors are closed and the building heated from a fire in the stove. The heat passes from the first to the second story thru openings around the inside of the walls.

Fig. 12 illustrates a combined garage and seed house the same size as the one described above but constructed of clay blocks with a stucco exterior. Brick may be used in place of the clay blocks and stucco, if desired. If the first floor of such a building is not needed for a garage, it would make an excellent work shop where a forge

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NOTE.—The buildings illustrated by Figs. 11, 12, and 13 have been designed by Mr. C. W. Bullard, architect, of the University of Illinois.

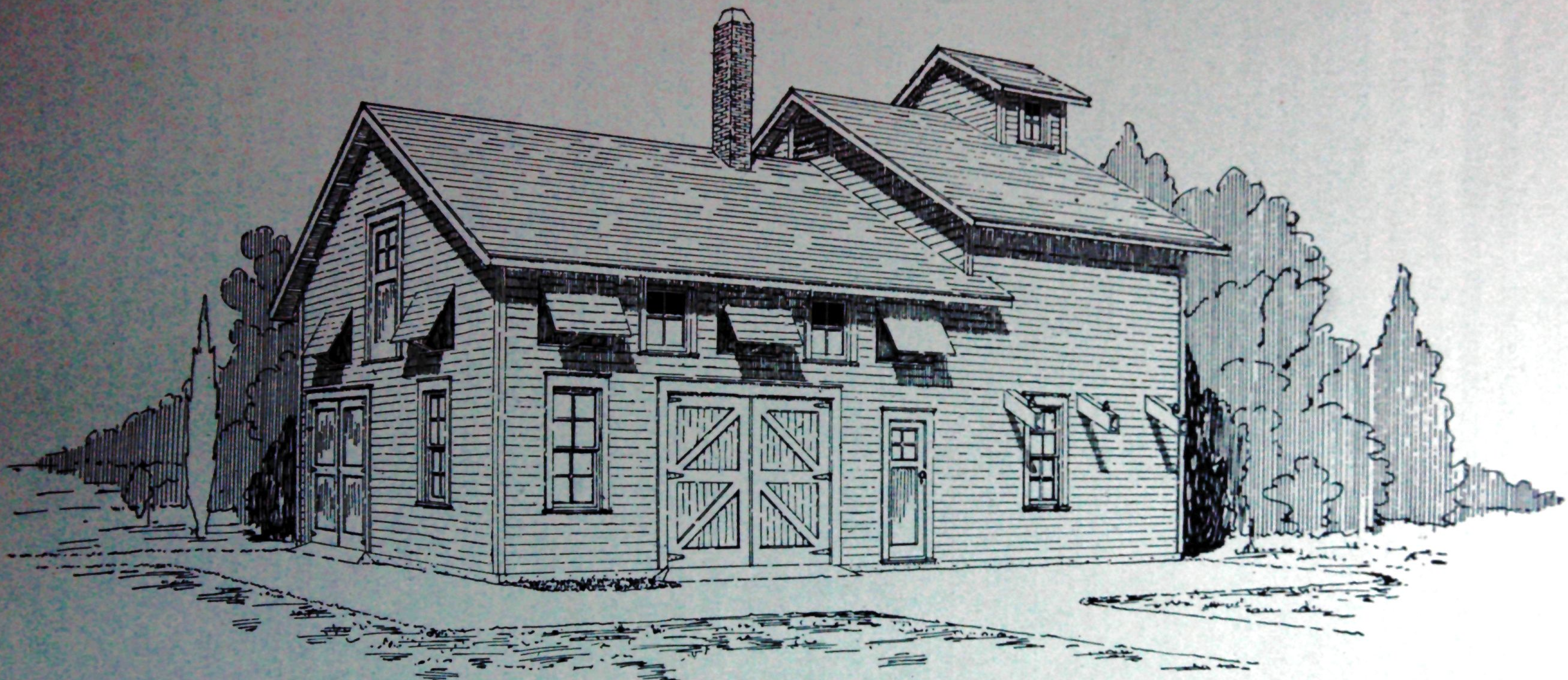

FIG. 11.—COMBINED GARAGE AND SEED-CORN HOUSE. WOODEN CONSTRUCTION

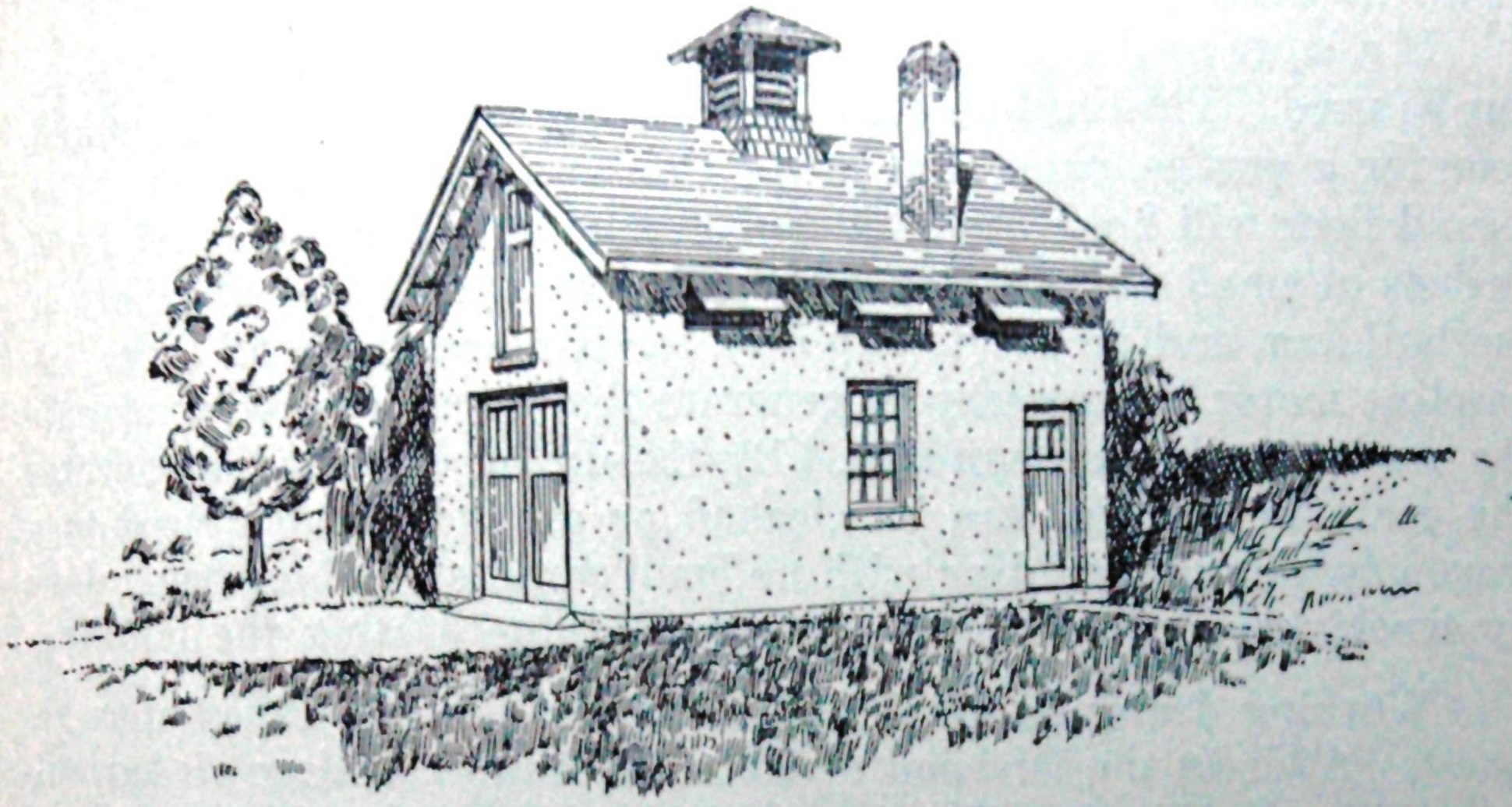

FIG. 12.—COMBINED GARAGE AND SEED-CORN HOUSE. CLAY BLOCK; STUCCO EXTERIOR

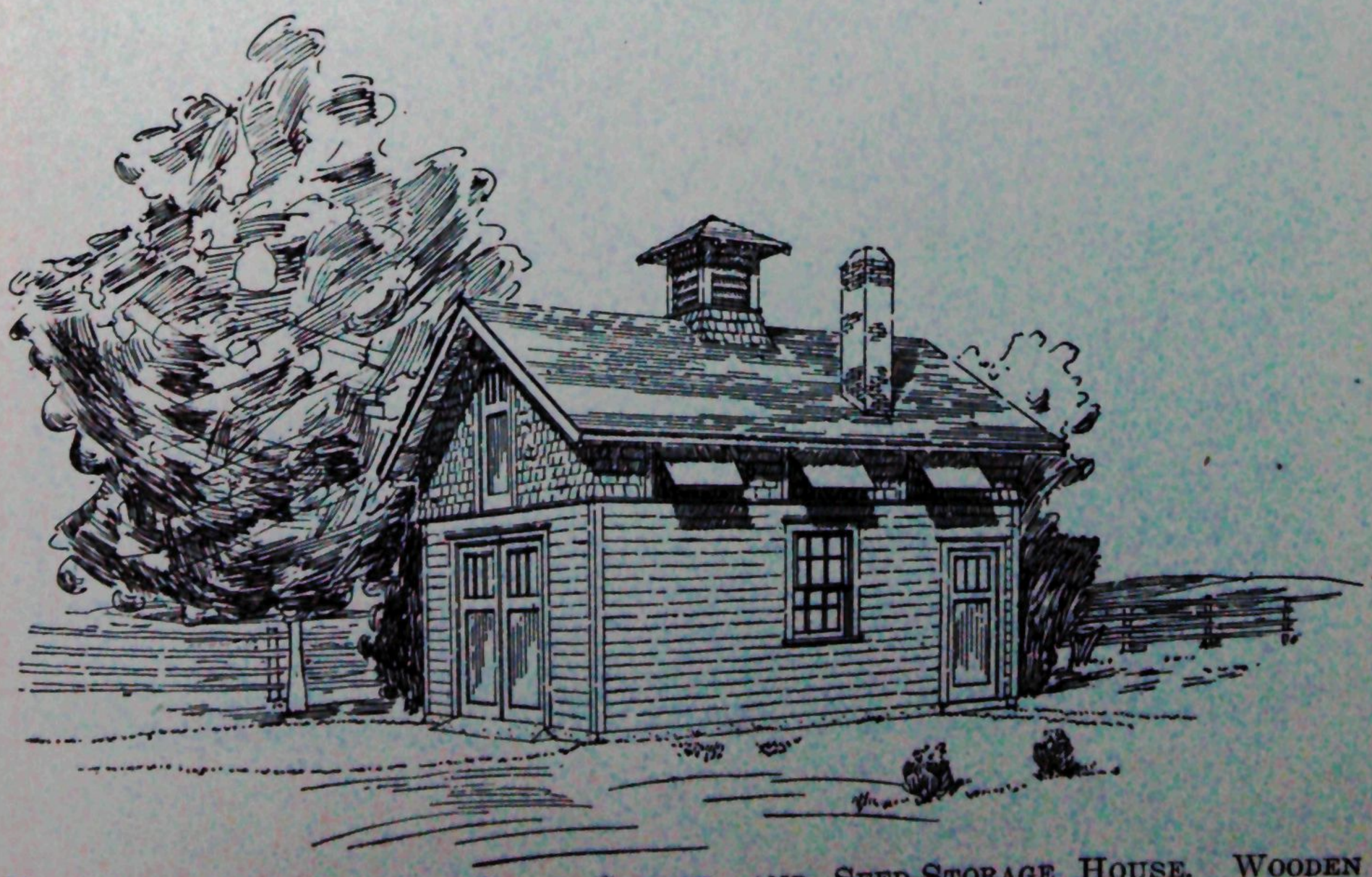

FIG. 13.—COMBINED FARM SHOP, GARAGE, AND SEED-STORAGE HOUSE. WOODEN CONSTRUCTION

could be installed. In cold weather a fire could be started in the stove, which would make the shop a very comfortable place in which to repair machinery.

If a large seed house is desired, the building illustrated in Fig. 13 can be used. This building is 24x46 feet, giving room on the ground floor for a garage, shop, and seed cleaning and grinding room. The second floor will hold from 150 to 300 bushels of seed corn and 1,500 bushels of small grain. The six bins are located in the taller part of the building, and an inside cup elevator is necessary to fill them. A gasoline motor is necessary to generate the power required to operate the machinery in this building. By the use of slides and an elevator the grain in the bins can be cleaned or ground and delivered to a wagon outside the building with no hand work, everything being done by machinery. Two stoves are provided for heating the building.

Working drawings for these buildings will be furnished upon request. Address the Division of Farm Mechanics, College of Agriculture, Urbana, Illinois. The drawings should be ordered by series and number according to the following:

Series A No. 1 Garage and seed house, wooden construction
Series A No. 2 Garage and seed house, clay block and stucco construction
Series A No. 3 Garage, shop, and seed house, wooden construction