

# SELF-FEEDERS FOR SWINE



The Iowa self-feeder in use

AGRICULTURAL EXPERIMENT STATION  
IOWA STATE COLLEGE OF AGRICULTURE  
AND THE MECHANIC ARTS

C. F. Curtiss, Director

ANIMAL HUSBANDRY AND  
AGRICULTURAL ENGINEERING SECTIONS

AMES, IOWA



Fig. 10. Ames self-feeder with slides removed.

# THE ESSENTIALS OF A SUCCESSFUL SELF-FEEDER FOR SWINE

(For Concentrated Feeds)

By John M. Evvard, J. B. Davidson and W. A. Foster

The satisfactory self-feeder for swine should, in a general way, possess these requirements:

1. *Simplicity*: It should be easy to build and easy to operate. The materials used had best be easily obtained, thus avoiding a "special order" with its probable difficulties.

2. *Convenience*: It had best be so arranged as to require the least time and labor of attention; it should be easy to fill, to clean and to adjust. The movable and portable feature commends itself to the swine farm, especially those equipped with movable hog houses, because of the ease of transference from one vantage point to another.

3. *Utility*: The feeder should be suitable for all kinds of grains, whether whole or ground, as well as ordinary commercial feeding-stuffs. Likewise, it had best be arranged or adjusted so as to feed different classes of hogs, thus increasing the possibilities of use. Then, too, it should be simultaneously useful for all sizes of hogs. The big eight-year-old stag, or the heavy, tall, matured brood sow should find the self-feeder as well adapted to its needs as does the little suckling or weanling pig, or the shote, or the big fat-hog, or the young gilt. Often in fattening, the "big" and "little" are run together and if best results are to be attained, the little pigs should have a free and equal opportunity alongside of the "bigger" of their kind.

4. *Substantiality*: The feeder should not be of flimsy construction so that it will easily go to pieces; it must withstand the heavy rooting tendencies of swine and be so built that it will not tip over; it must be rigid enough not to rack and make impossible the adjustable features; the base or attachments should be such as to avoid overturning.

5. *Sanitary*: The cleanliness requirement deserves emphasis. Inaccessible cracks and openings which are not readily cleaned may become filled with spoiled feed from which offensive and undesirable odors may emanate. Smooth walls and floors are to be insisted upon. The less likelihood there is of mud and filth being carried into the feeder, the more valuable is that feeder from the health standpoint. If the hog cannot readily put his feet into his feeding trough, so much the better. A concrete floor makes a very effective location for the self-feeder because it may be kept clean so easily under practical conditions. (A scoop shovel, rightly applied, is the best means for cleaning up.)

6. *Durability:* Substantiality and simplicity of construction are very desirable, but in addition length of service deserves emphasis. The self-feeder should withstand the weather as well as the daily wear and tear of ordinary every day usage thru the longest possible time.

7. *Encourage Economy in Feeding:* The size of the feed gate must be controlled by a simple device such as will encourage attention. If the adjustment is not easily made then the tendency is towards neglect.

The self-feeder that is made in dimensions and design to fit the conformation of the hog's body is to be commended, because feeding is made easier and more effective for both pig and man.

Successful protection against weather, wind, hail, rain, snow, and so on, encourages the conservation of feed quantity as well as feed quality; or put it this way,—preserves the feed in its entirety in its most palatable form, and thus makes feeding easier.

8. *Protection from Weather, Predatory Animals, and Domestic Animals Other Than Swine:* The cholera carrying pigeon needs to be barred against, as does the rat, crow, black bird, gopher and squirrel. The common barnyard chickens had best be screened away and ducks, geese and turkeys likewise discouraged. Cattle and horses and sheep may bother and it is well to provide against their entrance; of course, ordinary creeps can be fixed to keep these out, these being built around the self-feeder



Fig. 1. The Iowa self-feeder.

proper, thus avoiding the necessity for making the protective feature a direct part of the self-feeder itself.

9. *Allow an Abundance of Feed Without Undue Excess:* The fattening hog when on full-feed especially needs an abundance of feed within easy reach. It is possible to secure this without overflow. For the brood sow there might be provided a self-feeder which does not furnish an abundance of feeds (unless it be so bulky that the sow cannot overeat) so that the sow will not become overfattened. However, the essential above set forth is more directly applicable to fattening hogs. Supply latches which the hog must manipulate to force the feed into the feeding trough are sometimes used to insure abundance; likewise a turning device, wherein the whole feeder revolves on a pivot, is another scheme practiced. The self-feeder that insures a plentiful feed supply without an over supply is the thing.

10. *Sufficient Size to Feed Advantageously:* Capacity should be consistent with the number, weight and class of hogs to be fed in the various seasons and upon the different feeds. In order to avoid underfeeding it is essential that an abundance of trough space be provided, thus insuring that all pigs have equal opportunities to eat.

11. *Feed Hogs Without Undue Exertion on Their Part:* To overwork the fattening hogs during feeding is to discourage consumption at times. This is especially true in the latter stages of the fattening, likewise in the cold days of winter. The "merry go round" sort of feeders that compel the hogs to go around the round in order to make the feed come down may be advantageous under special conditions, as with the brood sows, because of the induced exercise, but not for fattening hogs, and they are hardly compatible with the self-feeder for concentrated feeds idea.

12. *Permit Feeding With a Minimum of, or Absence of Waste:* This presupposes the use of feed guards, or automatic trough covers which swing inward or lift upward, or other control devices. The trough measurements should be adapted to the conformation and habits of the pig so as to do away with the necessity for rooting or pawing and thus indirectly discourage the wastage of valuable feed nutrients.

13. *Low Reasonable First Cost:* There is much difference in the costs of the different self-feeders which may be built, but the standard for judgment in this respect should be cost commensurate with the service rendered.

14. *Minimum Cost of Maintenance, Including All Charges:* Interest, risk, depreciation, upkeep, labor of attention, and so on, are to be considered. What does it cost to feed a unit live weight of pigs per unit of time? The longest term of service at the least cost is the logical test. The maximum of feeding

trough space for a minimum amount of money, the feed storage space considered, is to be emphasized; likewise the cost of labor which is necessary to control, regulate, and adjust the feeder for the purposes used should be taken into account.

15. *Pleasing Appearance:* The satisfactory self-feeder is neat in design as well as sensible in construction. Good paint of suitable colors lends to its attractiveness. To add to rather than to detract from the appearance of the swine farm should be the builder's aim.

## **ADVANTAGES OF THE SELF-FEEDER**

(When Efficiently Built and Properly Used)

### 1. *Saves Time and Economizes Labor:*

*First*—Eliminates the time required in feeding thru less hauling of feed in small quantities and fewer trips with these small quantities to the feeding pen, and indirectly thru an increase in the number of the groups fed.

*Second*—Makes unnecessary the extra return trip to see if the pigs have cleaned up their feed allowance.

*Third*—May replace entirely in many circumstances the system of "slopping," which is very laborious.

*Fourth*—May reduce the feeding period necessary to take the pigs to a certain definite weight, inasmuch as thru self-feeding the gains are more rapid. In 1913, weanling pigs hand-fed ear corn and meat meal on alfalfa pasture took 206 days to reach 250 pounds in weight, whereas, their litter mates that were self-fed shelled corn and meat meal in separate self-feeders took only 180 days to reach the same weight. Other experiments have shown similar tendencies where self-feeding was practiced in comparison with hand-feeding.

*Fifth*—Less time is required to make, repair and clean out the self-feeding troughs, inasmuch as in the self-feeding scheme shorter troughs are to a limited extent self-cleaning. Obviously the self-feeder troughs need attention, however.

*Sixth*—Time is not wasted in looking for a place to throw the feed, this being especially true in wet weather when one feeds on the ground rather than on a concrete platform. With the self-feeder there is but one place to put the feed and that is in the self-feeder receptacle.

2. *Distributes the Labor More Advantageously:* The self-feeders may be filled with a wagon-load of feed at opportune times, such as on rainy days, and thus enable the feeder to do in a short time on a large scale what would take a long time on a small scale. Then, too, the self-feeders may be filled at almost any time of day; whereas in the hand-feeding scheme very regular feeding hours should be observed.

3. *Provides a Natural Way of Full-Feeding:* Often to insure full-feeding the average farm worker is not to be trusted. This is especially true in that there is a wide divergence of opinion as to when a pig is necessarily full-fed. The self-feeder keeps feeds before the pigs all of the time; in this way one can be assured that the pigs always have an abundance. It is not a case of being hungry today and overfed tomorrow. Conditions should be more uniform where the feed is continuously accessible.

4. *Permits a Free-Choice System of Feeding:* The availability of a number of feeds to be eaten according to the dictates of appetite of swine may mean in *specialized* instances the increasing of the income from swine. This system whereby the pigs have free-choice of feeding-stuffs has been quite generally spoken of as the *Iowa Free-Choice System of Swine Feeding*; it has been facetiously referred to as the "Cafeteria system." Eight months and four days old pigs weighed 316 pounds at the Iowa station in 1915, they having been fed in dry lot from weaning time at about two months; they received in separate self-feeders, shelled corn, meat meal or tankage, whole oats, linseed oilmeal, limestone, charcoal, and salt, making their gains quite cheaply or at a cost of \$3.92 a hundred pounds on the basis of corn at 50 cents a bushel, other feeds in proportion.

5. *Decreases Somewhat Constant Attention:* This is apart from the manual labor required. Self-fed pigs usually require a minimum of attention; however this does not absolve the successful swine herdsman from giving abundant thought and attention to his charges.

6. *More Convenient to Self Than Hand-Feed:* The self-feeder may eliminate to a large extent the "slopping" process so much in disfavor from the cleanliness and the drudgery standpoint. To substitute for the slop barrel something equally or more efficient is to promote the good interests of swine production.

7. *More Rapid Gains Are Generally Secured:* The hogs are put upon the market in the shortest possible time. Rapid gains, other things being equal, are much to be desired in fattening swine.

8. *More Economical Gains Are Usually Secured:* To put a marketable finish on hogs it is best in practically all instances to self-feed. The feed required for a hundred pounds of gain is generally less than when hand-feeding twice daily.

9. *A Quicker Finish May Be Attained:* This, combined with heavier weights for age, puts the fattening animals upon the market in the earliest possible time; a consummation of the feeding operations which is highly desired.

10. *May Economize in Feed:* This is true in that gains are more economical ordinarily and is likewise true in that the *feed-*

*ing may be accomplished without unnecessary waste of grain.* To market in the shortest possible time may mean a saving in feed indirectly because of the number of days less feeding required.

11. *Risk, Interest, and Depreciation May Be Decreased Somewhat:* The gains are faster, more economical and secured with less labor, meaning that the hog is placed upon the market at the desired weight in the least possible time, thus indirectly decreasing the risk from disease, lessening the interest on the investment and lowering the depreciation charges on equipment per hog daily, inasmuch as more hogs may use the same equipment after these have gone marketward. The disease, fire tornado, lightning and other risks are assumed for a less time in the self-feeding method.

12. *Discourages the Production of "Runts":* This is done primarily by giving all of the pigs a free and equal chance to the feeding trough. If an abundance of different kinds of feeds are allowed the small pig can balance his ration advantageously alongside of the big one. If a mixture of feeds is furnished, all sizes of pigs being fed together, then manifestly this mixture that is best for the big hog is out of balance for the little pig; hence the reason for usually dividing the pigs into various lots (when hand-feeding) according to age, size, and development, rather than keeping uneven individuals of different sizes together. In the *Iowa Free-Choice System* it is possible, but not necessarily advisable, to feed all sizes together; a combination of corn, tankage, or other suitable protein and mineral supplement, salt, and pasture being most excellently adapted to such a procedure.

13. *Promotes Sanitation:* The ideal successful feeder is arranged so that the pigs do not contaminate the feed by stepping in it. Good, clean, dry feed which flows into the feeder trough as it is eaten is much more acceptable, from the sanitary standpoint, than is that which is thrown out into the mud, filth, or which has been wallowed over by a herd of swine. Unless a concrete or other sanitary feeding floor is used in the hand method the swine incline to tear up the yards, especially in wet weather, in seeking the scattered and sometimes lost grains, thus making the surroundings disagreeably unsanitary. The eating of feed from a muddy mire is relatively an unpalatable business.

14. *Encourages More Thoro Mastication, Giving Pigs Plenty of Time, Without Competition, to Eat All They Will:* The pig that gets the chance to take what he needs leisurely, according to the dictates of his appetite, is not likely to "bolt" his grain.

15. *Allows the Swine to Eat More Frequently:* The young, few-weeks-old pig, especially if nature is to be followed, eats

(suckles his mother) many, many times during the day, often it is many times in a few hours. With young pigs frequent feeding seems to be most acceptable and this is supported by some experimental evidence. In practice, many would feed growing shotes more frequently than twice daily were it not for the extra labor involved. Inasmuch as the self-feeder eliminates the extra labor, the greater frequency scheme may be put into execution to secure advantage in the economy of gains. In a large number of the swine production experiments at Ames, frequent feedings have been advantageous as compared to feeding twice daily.

16. *May Discourage Gorging or Overeating:* When pigs are hand-fed once, or twice, or even three times daily, the tendency is for them to eat rapidly and gluttonously because of the competition on all sides for the feed allowance. The gorging habit is markedly encouraged if the amount of feed given is somewhat short of full-feed, thus inducing the rapid eaters to surfeit themselves with an oversupply of nutrients. While some in the herd are surfeited in the gorging process, others are far short of that, not receiving their full share. The surfeit-swelled, overfed pigs show their discomfort thru heavy drinking and general uneasiness, while the smaller ones, that did not get enough, likewise manifest their disapproval by a clamorous squealing for more grain.

17. *Permits All Swine to Adjust the Quantity of Their Ration:* The daily ration is not accurately adjusted in the hand-feeding scheme when the pigs are of different sizes, nor even when those of the same size (but of evident different capacities) are fed in groups. No two pigs will daily eat absolutely the same amount of different feeds or of a mixture of feed. Full-feeding can be approximated with a self-feeder even tho all sizes eat together.

18. *The Amount of Water Drunk Is Lessened:* Peculiarly enough, where pigs are full-fed, naturally, thru the self-feeder, they drink somewhat less water than where they are hand-fed twice or three times daily. This indirectly saves considerable pumping, which may be costly if done by hand.

19. *May Enlarge the Feed Storage Space:* A self-feeder of large capacity may supplement the regular granary or crib storage.

20. *Minimizes the Trough and Feeding Floor Space Necessary:* In hand-feeding methods where all the pigs eat at one time, a foot of trough space may feed from three to four little pigs, but not more than one, or at the most, two big ones; this foot of trough on the self-feeder will feed from three to ten times as many, inasmuch as self-fed pigs may eat at all hours of

the day. A concrete or other feeding floor, while commendable even with the self-feeder, is not so urgently necessary, inasmuch as the pigs eat from a constantly supplied trough which is much smaller than where the same number of hogs are hand-fed. Then, too, the necessary area occupied by the self-feeder is much smaller than where the pigs are hand-fed by the scoop or trough method, thus lessening the feeder floor space needed.

21. *Feed May All Be Allowed Under Cover:* The self-feeder may be placed in the hog house, movable or community, or in the combination hog and cattle barn, or under a "lean to", and thus enable the pigs to eat and the men to feed away from the weather. The winter-fed fattening hogs that have a warm place in which to eat will make more economical gains than if they are compelled to be in the open where the cold winds blow and chill them, where the rains beat down upon them, and where they eat out of the wet and dirt. Peculiarly enough, the outside-fed ones on the zero days will eat much less than inside-fed ones; there is little question about this. A concrete feeding floor on the outside does not help matters in these respects. The important thing is to keep the hogs warm by providing suitable shelter, and furnishing the feed within the shelter; this is practically done in the self-feeding scheme.

22. *May Eliminate the Squealing for Feed:* Hungry swine naturally squeal loudly for feed and it may be considered advantageous to prevent these clamorous appeals. The necessity of calling the pigs to their feed twice daily is likewise rendered unnecessary.

25. *Promotes Happiness and Contentment:* With the self-feeders full, the herdsman may conscientiously leave his hogs over Sunday or any other day, knowing that everything is well and that when the hour of six comes that he will not need to be at home feeding the hogs. Incidentally, the self-fed pigs are contented and their contentment bespeaks happiness on the part of their owner.

24. *Present a Pleasing Appearance:* The self-feeders, if successfully built and nicely painted, should in themselves add to the attractiveness of the swine farm. Then, too, the self-fed swine, rightly handled, are usually more sleek and healthy in appearance than swine hand-fed on identically the same feeds.

## DISADVANTAGES OF THE SELF-FEEDER

Probably there is no idea or method so advantageous and so good but what there are attending disadvantages. This is true regarding the self-feeder; it has some patent disadvantages which are enumerated below.

1. *Necessitates Outlay of Material and Labor in Building:* This is but natural and the question arises, "Is the self-feeder worth the price?" Our answer is, "Yes, if properly used." In the long run, with the self-feeder properly applied, one saves enough in material and labor more than to compensate. It is to be said that the more groups of hogs there are separately fed, whether these groups be large or small, the more feeders are required. It is well to emphasize here that one needs less concrete feeding floor with the self-feeder than where hand-feeding is practiced; hence a marked saving is thus creditable to the self-feeder.

2. *May Be Used Inefficiently:* With such a handy device as the self-feeder available for feeding swine, is it any wonder that some swine feeders have used it when they shouldn't? Isn't it but human to experiment with a labor-saving device and thus learn thru experience just how far one may practically proceed in its use? This has happened with the self-feeder, as for instance in the feeding of aged pregnant brood sows on concentrated feeds allowed in the self-fed way. These sows most often get too fat under these too easy conditions of life, and thus, being pampered and encouraged to lie around, they do not do justice to themselves or to their owner at farrowing time, nor thereafter for a time. Prospective breeding gilts that are being developed from weaning time on should not be self-fed on concentrated feeds for too long a period, else they will be likely to fatten unduly and show weaknesses of pasterns and bone that are tabooed in the breeding pen. All this does not mean that brood sows and prospective breeding gilts cannot be self-fed in any way whatsoever. They may be very properly self-fed on roughages like alfalfa or clover hay, or on good pastures like alfalfa, red clover, rape, bluegrass and others. We here emphasize the difficulties accruing from the overfeeding of concentrates such as corn grain, milk, tankage, and such like.

Heavy, well-grown, laggy, or sore-footed aged brood sows that are to be fattened to a high finish and marketed for pork may really in some cases consume more feed, put on more gains and require less feed for 100 pounds of gain made where properly hand-fed, even tho the self-feeding is well done. The stimulation of the feeder's presence two or three times a day encourages such sows to get up and eat; whereas if self-fed they may eat only once, maybe twice a day, lazily lying around the rest of the time. Such sows seem to react to human companionship and interval feeding. This hint to the close observer should suffice.

One must use his head in a common-sense way and mix a proportionate amount of brains or judgment with his self-feeder procedures if he would gain the most from this highly efficient

contrivance. To self-feed properly and efficiently involves the correct use not only of the equipment but a correct application of the best methods in feeding. Even so commendable a contrivance or weapon as the double-barreled shotgun must be used with intelligence and applied with much discretion. The self-feeder is likewise a double-barreled affair.

3. *Likelihood of Neglecting Herd:* The self-feeder in many ways makes things too easy and hence the feeder will assume that all is well when not justified in so assuming. The principle, "the eye of the master fattens his swine," is no less applicable than it was hundreds of years ago. Stolen or strayed hogs cannot be sought intelligently unless one, on his daily visits to the self-fed or other pens, first discovers that there are absent ones. Nothing suffices to learn what happens in a group in a case like this, excepting close observation and rigid inspection. Eternal vigilance at the swine pens is necessary always in order to note changes, big and little, some of which may be disastrous if not noted and attended to. This means daily inspection and daily application of remedies to avoid the spread of diseases. Procrastination in regard to these little journeys to the swine yards should not be cultivated, but the daily visits should regularly be made.

4. *May Limit Exercise:* This is really an advantage in the case of fattening shotes that are intended for immediate market. Breeding hogs should not be self-fed unless the self-feeding scheme is properly modified. If, for whatever reason, one wishes his hogs to take considerable exercise, he must look with suspicion upon the self-feeding of concentrated feeds method, but regard with enthusiasm the self-feeding of pasture grasses and forage plants in the wide open fields.

5. *May Limit Pasture Consumption:* This is true for fairly mature hogs, brood sows, and breeding boars, but not necessarily true of young growing pigs. In some of our hand versus self-feeding experiments with growing and fattening pigs from weaning time to 200 or 225 pounds marketable weight, the self-fed pigs have actually consumed more pasture than where hand-fed. This is a complicated question, one that cannot be disposed of in a few words, but we would emphasize that perhaps less pasture consumption, under some specific conditions, is the most desirable. However, for maintenance, or growing stuff not intended for the fattening pen, the wide use of broad open fields of good pasture is to be commended, whereas for fattening stuff, big or little, consider the full-feeding method most seriously before deciding.

6. *May Decrease Rustling Ability:* This is self-evident to the practical hog man. The heavy full-feeding of swine on concentrated feeds after they have reached 75 to 100 pounds

weight tends to fatten them, and thus make them relatively poor rustlers. However, if bulky feeds are used, such as whole ground oats, the "rustling" tendencies may in some cases be increased for a time. Very young pigs, suckling or just weaned, really make better rustlers in the long run if liberally fed, even self-fed for a time, than where given limited rations.

7. *Discourages "Carry Over" or Maintenance Procedure:* Swine that are fattened on the self-feeder are, relatively, poorly adapted to carrying over for a later market, or reducing to maintenance. Such hogs are not so well adapted to following cattle as limited fed and slowly grown ones. This is inherently true of full-fed hogs, and fortunate is it that self-feeding is such an attractive and efficient method of full-feeding. Our warning is, "Be careful to self-feed only when you want to full-feed to the best advantage."

8. *May Necessitate More Preparation of Feeds:* Some folks have self-feeders adapted only to shelled or ground grains (or feeds), hence the difficulty of shelling or grinding is presented. There is another side to this, however: Ear corn, for instance, can be self-fed quite efficiently, and special feeders are available for this procedure. Of course, lumpy feed, in which the lumps are extraordinarily large, offers a problem in self-feeding thru ordinary self-feeders. In most cases such material is well hand-fed. Sometimes swine are self-fed on alfalfa hay, for instance, and it is desired often that these hogs, brood sows perhaps, consume considerable of the protective hay. Naturally, grinding is in order to encourage such consumption, but this is true for hand as well as self-feeding. When ground, the hay meal can be readily mixed with other ground grains and thus self or hand-fed in such a way as to gain the advantage sought.

In case one has shelled corn to self-feed, the use of a mixture involving the adding of ground alfalfa or tankage meal means that the shelled corn must be ground and thoroly mixed with these materials, else the pigs are likely to pick out the shelled corn, or vice versa, depending on conditions of growth and development.

To think is necessary in the intelligent use of the self-feeder when mixtures are resorted to for the benefits, financial and physiological, expected to accrue.

### **SELF-FEEDER TROUGH SPACE FOR SWINE**

The question is often asked, "How much trough space shall we allow for fattening swine, taking them from weaning time to market maturity?"

A 16-inch compartmental feeding space, that is 16 inches in the clear, is sufficiently large for the entire life of a pig, taking

him from weaning time on to ordinary maturity, say of 250 or even 500 pounds; 6 inches is enough for small pigs.

One space will take care of 3 to 12 or possibly 13 pigs from weaning time to market maturity, but this number depends upon the amount of spaces provided. The more spaces allowed, the more pigs will be fed per space, or to make it a little more definite, the following general allotment per space depending on number of spaces, is instructive:

- 1 space will feed 3 to 4 pigs.
- 5 spaces will feed 30 pigs or 6 to the space.
- 10 spaces will feed 80 pigs or 8 to the space.
- 20 spaces will feed 200 pigs or 10 to the space.
- 30 spaces will feed 300 pigs or 12 to the space.

These are all approximate, but represent reliable averages.

One man had 32 spaces to a self-feeder and fed with it 400 head of swine from weaning time to 300 pounds. He found, however, that these spaces were not far enough apart, so that only 20 pigs could stand side by side when they got large, whereas 32 could nicely eat when they were small. By enlarging to 48 spaces he had an abundance of room thru the entire time; in other words,—the spaces were so built that 30 could eat finally when they were big and lined up side by side. If 30 pigs can eat at a time a self-feeder is large enough to take care of 300 head.

Another man had 18 spaces or stalls, these being 14 inches from center to center or 13 inches in the clear; the entire feeder was 24 feet long. And with it he fed 232 head from weaning to market and they all apparently got enough to eat; their final weight was 317 pounds.

Still another man provided 56 spaces or stalls for 500 hogs or practically 9 to the stall. However, these followed cattle and got some of their feed in other ways. Fifty-six stalls, however, should be enough for 500 hogs if 56 pigs can stand up side by side and eat.

Generally speaking, one had best not have more than ten pigs to the trough stall in order to secure best results. In other words, no pig should be compelled to stand around and wait for a chance to feed. When a pig wants to eat, space should be opened for him. If as many as 30 stalls are provided, one can depend upon it feeding approximately 12 pigs to the stall, altho if one wishes to play absolutely safe he had better figure on ten.

### **CLEANING UP AFTER SELF-FEEDERS**

In order to keep the feed around the self-feeders cleaned up as well as possible or to keep it from collecting, the following suggestions are important.

1. *Have an Adjustable Slide* so that the feed can be controlled; in other words, to shut off or turn on in order to keep the slide regulated.

2. *Fix Feed Guards* so that the pigs will have to eat without rooting; in other words, so that they will have to stick their heads thru an aperture to get the feed. Feed guards can be strongly made out of gas pipe with cross bars or even out of wood.

3. *If Feed is Rooted Out Sometimes the Pigs Will Clean It Up if Salt or Palatable Mineral Mixture Finely Ground Is Put on It*, providing of course that salt is not given elsewhere. One feeder practiced this to advantage, simply sprinkling salt over the refuse feed or the rooted out feed, and the pigs cleaned it up.

4. *Turn in the Cattle, Say Once a Day*, after the fat hogs have eaten at the feeders. Let some stock hogs in, brood sows, etc., and let them clean up. Of course it is well to shut the feeders down so that they can't get any new feed out unless it is not so desired.

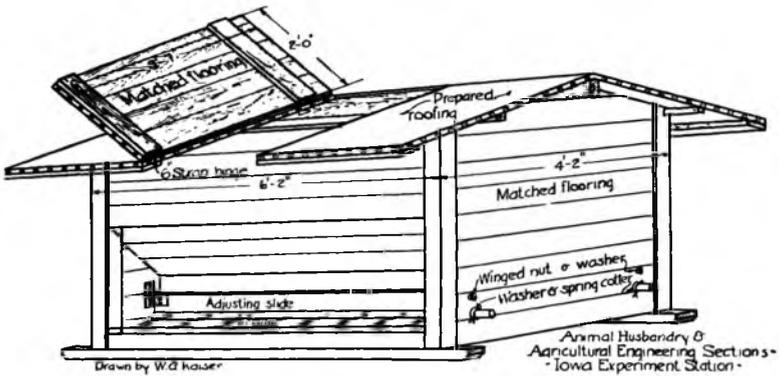
5. *Have the Troughs of Dimensions Natural to the Hog* so that the hogs can get into them without putting their feet in. This helps to prevent waste and tends to overcome the pulling of the feed out of the trough.

6. *Eliminate the Rooter That Persists* because of his temperament in rooting out the feed; put him in another lot. Some pigs are born naturally mischievous and they must either be trained differently or given new grounds in which to work.

7. *Do Not Self-Feed a Mixture of Separate Feeds Such as Shelled Corn and Tankage*, inasmuch as it is hardly right for any pig, that is, the odds are against its being mixed right, hence, the pigs will root the feed out and pick it over in order to get what they want. They will naturally attempt to separate it, and of course it is easier to separate the feed out on the floor than in the feed box; therefore, avoid if possible the stereotyped, man-mixed, hash-like mixture.

A homogeneous, or evenly ground mixture, however, must sometimes be resorted to in order to do economical feeding. For instance, corn oil cake meal, when priced attractively, is well fed by mixing with the highly palatable meat meal tankage or fish meal, this insuring the greater, more acceptable consumption of this good corn product food.

8. *Feed Palatable Feeds*,—feeds that are clean and free from molds and undesirable odors, feeds which when combined make an adequate ration. The pig likes clean, palatable feed, and the more it is to his liking the more likely he is to eat of it without fussing.



PERSPECTIVE IOWA SELF FEEDER

Fig. 2. Perspective of Iowa self-feeder.

### THE IOWA SELF-FEEDER

The Iowa Self-Feeder has been successfully used by the Animal Husbandry Section of the Iowa Agricultural Experiment Station, as well as by practical men on the farm. This self-feeder is quite simple in construction and of attractive appearance. (See illustrated cover, also figs. 1 to 7, inclusive.)

Some of the good features of the Iowa self-feeder are:

1. Quite easy to build and to manipulate.
2. Very convenient, inasmuch as it is low down and requires little adjustment, this being especially true of the control gate.
3. Very substantially built, being well braced and being equipped with iron trough guards.
4. The construction is such that there is a minimum of temptation for the pigs to put their feet into the trough.
5. The feed is protected from the rain to a large extent by the projecting roof cover and the small trough opening, both of which prevent rain entering the trough; the swinging trough cover likewise may be used and thus keep out considerable of the weather as well as chickens and rats.

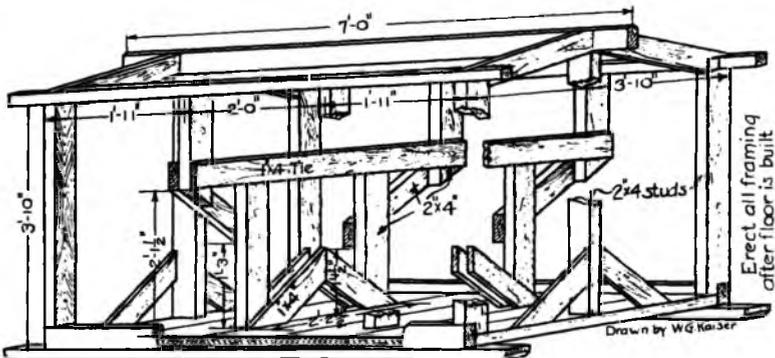


Fig. 3. Frame of Iowa self-feeder.

6. Furnishes considerable storage capacity. (This may be enlarged, however, by increasing the height as well as the width of the feeder somewhat.)

7. Is movable because of the ground runners being somewhat similar to the movable hog house in this respect. To move this feeder the rope and team method is very successful. Simply take a strong, heavy rope, throw it over and around the feeder, making it snug to the walls; fasten the rope ends to a clevis and draw where wished.

This house may be used under cover as well as outside, altho it is primarily built to be used in the open. In the dead of winter, however, when it is very, very cold, it may be entirely advisable to use it in a protected place so as to encourage a maximum of consumption by the hogs.

### CONSTRUCTION DETAILS

In building the Iowa Self-Feeder, as well as others, some features of construction need to be thoroly understood; these follow for the self-feeder discussed:

#### RUNNERS

The runners or skids really provide the foundation for this self-feeder. The runners herewith shown (see figs. 1 to 6, inclusive) are made of 2x4's. However, a 4x4 may be used if necessary; the 4x4 has the advantage of giving greater substantiality and durability to the feeder. Such woods as fir or cypress are to be preferred because of their lasting qualities. The 2-inch material has been used in order to keep the feeder trough closed to the ground, and it is especially adapted if this feeder is to be used on a concrete platform or under cover where conditions conducive to decay are not so unfavorable as on the ground in the out-of-doors. Some may prefer to shoe the runners with steel about as thick as an ordinary wagon tire, but this is quite expensive and hardly worth the additional cost; the steel runners may be advisable if the self-feeder is moved daily.

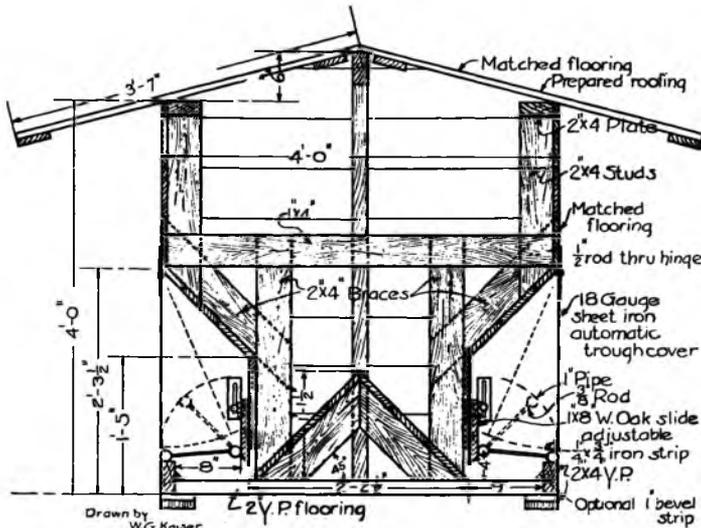


Fig. 4. Cross section, Iowa self-feeder.

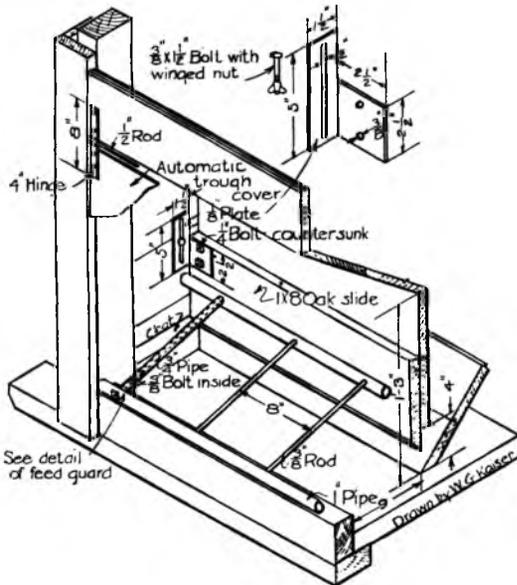


Fig. 5. Detail showing feed gates, guards, etc.

because these resist decay. Yellow pine is likewise very good, especially if the floor is kept off the ground, as when runners are supplied or when the feeder is used on the inside. White pine is too soft and if used as the bottom of the feeding troughs the hogs will eat thru it in a short time. The harder yellow pine is much more satisfactory, if pine is to be used. Hemlock can be used with a fair degree of satisfaction for the floor portion, but in this case the trough would best be fitted with an overlay of some other wood such as yellow pine, because of the softness of the hemlock. Matched flooring, which is tight and rain proof, may be very desirable if secured in sufficient thickness.

In feeders, such as the Iowa, the floors had best be laid crosswise with the runners as shown. (See figs. 3, 4 and 5.)

Be sure to make the floors snug and tight, otherwise the grain will sift thru onto the ground and thus waste or lodge in cracks and produce decay of floor; use well-seasoned lumber so that the shrinkage later will not produce these undesirable feed-losing cracks.

### FRAMING

The design submitted (see figs. 3 and 4) is of a very substantial frame, made of 2x4's for the main skeleton, with 1x4 tie pieces. With a feeder built and adjusted as this one, it is quite advisable that the frame be very rigid and strong so that the trough sides and feed bins will not warp out of shape, and thus encourage the dissipation of feed thru wastage; likewise any distortions resulting indirectly from weak framing will make the adjustable slides or gates work with difficulty and thus decrease efficiency.

White or yellow pine No. 1 or No. 2 may be used successfully in the frame work, the construction of which is clearly shown in figs. 3 and 4.

The four series of upright frame sections shown in fig. 3 make this feeder especially rigid. This frame being made in a series of four up-

Concrete runners which have been successful on movable hog houses would likewise work well here. However, the additional trouble of making forms for the runners needed on the average farm to equip the self-feeders would hardly be justified.

### FLOORS

Two-inch floors are desirable in all of the self-feeders, this being especially true of the bottom of the trough; one-inch material does not stand the wear and tear of ordinary usage.

The kind of lumber used in the floor should be preferably fir or cypress

right section (fig. 3) makes it especially strong. These sections are best placed two feet apart if large feeders are to be constructed.

The cross sections framing shown is so built as to scientifically meet to the best advantage the stresses put upon it, those from the inside due to the pressure of the grain, which is downward and outward, and those from the outside due to the moving of the structure, which are longitudinal as well as vertical, and the pressure upon the inner side of the feed trough, which is inward. The 1x4 tie, which binds the two outer 2x4's together, as well as holding firmly in place the central uprights, may possibly be dispensed with on every other section, but so little lumber is used here, that this is not to be recommended.

Wind braces may be diagonally placed in the roof from the point of the corn bin to the opposite lower corner; these being placed on the side in which the feed door is not placed and thus add to the general rigidity of the structure, indirectly encouraging the doors to fit.

The roof door may be placed on either side, or on both sides; 2x4's extending from the ridge poles may form the opening of the door and give a place for hinge attachment. The door crack is protected from rain by a batten on the one side. Greater capacity is secured by placing the grain doors in the roof than by placing them in the gable ends.

### SIDING AND ROOF

The Iowa Self-Feeder may be covered with matched flooring or dropped siding most successfully, inasmuch as this is very tight, and is quite suitable to granaries, which in reality is the body portion of this feeder. The matched lumber excludes water quite successfully. This flooring had best be of fir; however, either white or yellow pine may be used.

The ordinary 10-inch shiplap which is quite tight is quite satisfactory, this being preferably of yellow pine for the sides and white pine for the roof. The white pine stands the weather to a greater advantage than the yellow. It does not ordinarily shrink so as to necessitate the addition of battens, nor emit rosin, which is disagreeable to the herdsman, and which may cause the paint to peel.

A durable, reliable grade of prepared roofing may be used to cover either the matched flooring or the shiplap used, in order to insure protection to the housed grain; this is quite advisable. The Iowa feeder is shown equipped with this prepared roofing. (Figs. 1, 2, and 4.)

The corners are reinforced with 1x4 uprights so as to bind the ends of the side lumber snugly, and in addition these upright corner strips add greatly to the general appearance of the house, giving it a more impressive and finished character.

The hinges for the feed door had best be three in number so as to insure satisfaction. Some use four, but this is hardly necessary; the only disadvantage, however, is the expense.

### TROUGHS

The trough deserves considerable attention, especially as regards size and general dimensions. An ill-proportioned trough is unsatisfactory because it is not adaptable to the conformation of swine, thus causing them to waste feed, not only by rooting it from the trough, but by putting their feet into it; in addition the trough must best be made so that it will work nicely in conjunction with the feed supply space.

The Iowa trough has a vertical opening of practically 24 inches, this being found quite satisfactory for all classes of swine of ordinary size. The compartment is practically 10 inches wide when measured from the outer trough surface to the adjustable slide, but the inside meas-

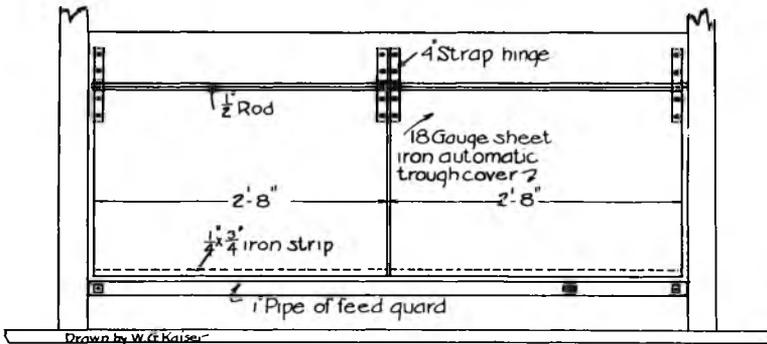


Fig. 6. Detail of automatic feed trough cover.

urements are exactly 8 inches on the floor of the trough with the adjustable feed control or sliding gate down. These measurements should not deviate much over those given if best results are to be expected.

The trough in the Iowa Self-Feeder is so built as to furnish much protection from rain, the side of the feeder being extended downward on a vertical line with the front of the trough so as to allow only a 2-foot trough opening. The rain, therefore, that beats upon the side of this feeder above the trough proper simply drips down without getting into the feed compartment, unless, of course, the wind is very strong and from the right direction so as to blow the drippings into it. (Consult figs. 1 to 6, inclusive.)

Fir lumber will be found quite satisfactory for the front of the trough, as well as for the floor; yellow pine is likewise good. Of course, the harder and more substantial the lumber, the greater the durability of the trough. It is well to build the troughs carefully so as to make them last in accordance with the other portions of the feeder. The trough is really the vulnerable point, and any reinforcement given to it really increases the life of the feeder.

The detail, showing the trough, feed control gate, feed guards, trough cover, and other essentials, is presented in fig. 5.

The inverted V-shaped feed accelerator or incline, which really provides the lower portion of the storage bin, is best inclined as detailed in figs. 4, 5, and 6. This feed accelerator is so arranged as to encourage and permit the feed to enter the trough at the inward lower side, just at the base of the feed control gate. If this incline is made too steep, the feed will clog at the throat opening; whereas, if it is not made steep enough, some of the slower moving, more compact grains will not flow freely. This incline feed accelerator is best covered with smooth, well-planed lumber so as to lessen the friction of the feed passing over it; the smoother the lumber, other things being equal, the less the pitch necessary. However, for all ordinary purposes the inclines specified will be satisfactory with smooth lumber used as designated.

#### FEED CONTROL GATES

This gate or adjustable slide for controlling the amount of feed entering the trough indirectly thru making the capacity of the opening or throat larger or smaller, as the case may be, had best be made of hard wood, preferably oak, that will not warp, nor be flexible, inasmuch as this slide must on closing cut into the grain; it is well to have it made of very hard material because the soft wood will wear

off at the bottom, and thus make a rough cutting surface, that is, it will be a drawback to easy manipulation. The bottom of the dividing slide, beveled, had best be toward the inner side in order to facilitate the closing adjustment. In case of soft wood slide construction, it may be advisable to reinforce the lower edge with a mortised steel strip. Then, too, with hard wood, the adjustable end irons are more substantially connected. (The adjustable slides or gates are shown clearly in figs. 4 and 5.)

The width of the slide had best be 1 inch so as to encourage ease of adjustment as well as to discourage an undue lessening of the horizontal feed trough space.

It is to be noticed that the adjustable slide works up and down in between the granary wall proper and the horizontal iron pipe rod of the feed guard (see fig. 5), thus making it snug and substantial.

The adjustable gate is manipulated simply by loosening or tightening the end nuts of the control slide. The slide is moved upward or downward by means of the hands; sometimes it may be necessary to use a bar to pry the slide or gate up, but an ordinary hammer can be used to drive it down.

### FEED GUARDS

To discourage feed wastage, the guard is very essential. (See figs. 1, 2, 4, 5, and 7.)

The detail construction of this feed guard is shown in fig. 7. It is well to note that altho the outer cross rods are equipped with threads and nuts, all of the others simply are held in place thru insertion in the holes drilled into one side in the inner and outer longitudinal pipes, the upper one of which extends thru both ends of the feeder, being held in place by spring cotters.

These cross rods are preferably  $\frac{3}{8}$  inch in diameter; they may be placed 8 inches apart for all ordinary usage, altho it would be a simple matter to drill extra holes in the 2 horizontal main pipes to permit of adjustment. These holes can be placed two inches apart; therefore, the rods can be adjusted so as to show 2 inches, 4 inches, 6 inches, 8 inches, or 10 inches, or other size openings, increased or decreased by 2 or a multiple of it. Investigations have demonstrated the 8-inch openings to be most desirable for all classes of swine.

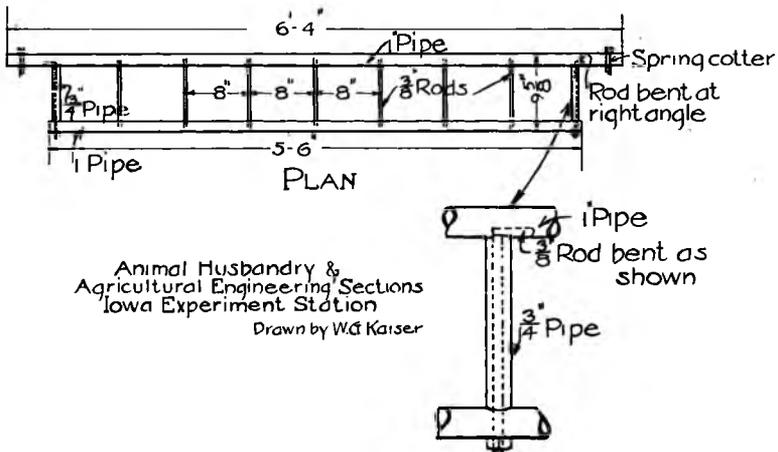


Fig. 7. Detail showing feed guard construction.

This substantial feed guard can be easily made, and is greatly to be desired in comparison with the ordinary wooden kind, inasmuch as the length of service is much longer, and the satisfaction of use is more pronounced.

Note that the feed guard system swings on the upper horizontal iron pipe which turns in the two holes made at either end of the feeder. To clean out the trough, therefore, it is simply necessary to catch hold of the lower pipe, which rests on the front of the trough, and lift it up. This opens the trough in its entirety so that a shovel or other instrument can be used to thoroly clean it out from end to end; this done, simply drop the feed guard back into position. It is unnecessary to bolt this guard down as shown in fig. 1, the hogs not tending to root it upward to any extent whatsoever, but rather preferring to reach over it persistently. With this iron feed guard resting on the top of the front of the trough, the length of service of the trough itself is increased. Most troughs usually wear out first on the front where the hogs reach over, the wear and tear being greatest at that point. With the iron pipe, however, extending from end to end, the wear and tear comes entirely upon it.

If the feed guards are dispensed with (and this is not to be recommended) then it will be best to supply a protective covering of steel for the top of the front of the trough.

This feed guard has the advantage that it prevents the hogs from rooting the grain out, encourages each hog to eat in its own separate compartment, discourages the placing of feet into the trough, prevents fighting to some extent, inasmuch as the hog eating at its own compartment is not bothered by the others, and furnishes excellent support to the adjustable slide, as well as a durable cover for the front of the trough.

#### AUTOMATIC TROUGH COVER

To protect the grain from the weather, and to discourage animals, other than swine, from entering the feed compartment, as well as to encourage the pigs themselves to eat up the feed thoroly without wastage, an automatic trough cover has been devised. It is quite interesting to know that with a little feed remaining on the outer side of the trough, the pig will tend to eat that up rather than open the automatic trough cover (or cupboard door) to get more. With this trough cover not present the inclination would be to eat from the trough rather than to clean up what was on the outer side of the feeder.

The automatic trough cover is shown in part in fig. 5, a cross section is presented in fig. 4, and fig. 6 is devoted entirely to showing the construction.

This automatic trough cover had best be made of good heavy sheet iron, preferably 18 gauge, in order to prevent its bending. This cover is reinforced at the top and at the bottom with cross bars which tend to hold it substantially together as well as to give it weight and rigidity.

On a six-foot feeder as this Iowa is shown to be, it is well to have the trough cover divided into two sections in order to prevent its being drawn out of shape, which would necessarily follow if the pigs at one end of the feeder would have to open simply one curtain for the entire feed trough. The stress would be so great in this case that it would be likely to bend the cover. It is really desirable to make this cover not more than a foot and a half wide in many instances, but it is shown in a 2-foot 8-inch width in fig. 6. The back supports for this cover should be substantial and strong, inasmuch as they get considerable wear and tear.

This cover is entirely optional and should be considered as such. There is a feeder which has a cover so manipulated that the hog has to lift it up in order to get into the feeding trough; this could be arranged on a feeder of this sort to good advantage. The hog soon learns to root up the cover and get at the feeds inside. When this sort of cover is used it is hinged on the inner portion of the trough, and has an incline similar to that shown for the feed guards. In truth, it could be arranged so as to work right on top of these feed guards, being hinged on the inner and upper feed guard pipe which runs horizontally.

### PAINING

The expense of painting the wooden self-feeder should prove a good investment, inasmuch as it prolongs the life of the structure and adds greatly to its appearance. Any reliable outside paint will be satisfactory, two coats being given to insure that the wood be thoroly covered. The paints made with a base of white lead and raw linseed oil are very serviceable, having stood the test of time.

### BILL OF MATERIAL IOWA SELF-FEEDER

2 pcs. 2"x12"x12' No. 1 Y. P. for floor  
 1 pc. 2"x4"x14' Fir for runner  
 1 pc. 2"x4"x12' No. 1 Y. P. for trough front  
 8 pcs. 2"x4"x12' W. P. for framing  
 32 pcs. 1"x6"x12' No. 2 Fir clear flooring for sides and sheathing  
 6 pcs. 1"x3"x12' W. P. Com. boards for corners  
 4 pcs. 1"x4"x12' No. 2 W. P. boards for cleats and braces  
 1 pc. 1"x8"x12' White Oak slide  
 ½ sq. prepared roofing  
 5 lbs. 6d nails  
 3 lbs. 8d nails  
 3 lbs. 16d nails  
 1 pr. 6" strap hinges  
 4 brackets for adjusting slide  
 4 ⅜"x1½" machine bolts with washers and winged nut  
 24 ft. 1" Black Pipe  
 4 ft. ¾" Black Pipe  
 12 ft. ⅜" rod, 4½ lbs.  
 8 1¼"x⅜" plow bolts  
 4 2½" cotter pins  
 1 gal. paint to double coat 100 sq. ft.  
 Labor estimate, 20 hrs.

#### *Extras:*

Automatic trough cover  
 1 sheet 21"x32", 18-gauge sheet iron, 38 lbs.  
 4 pr. 4" strap hinge  
 12 ft. ¼"x¾" flat iron bar, 7 lbs.  
 12 ft. ½" rod for hinge pins, 8 lbs.

Vertical feed guard (optional)  
 1 pc. 2"x4"x12' No. 1 W. P. for upper horizontal support  
 23 ft. ½" rod for guards, 15 lbs.  
 Extra labor, 6 hrs.



Fig. 8. Ames self-feeder, large size.

### THE AMES SELF-FEEDER

The Ames self-feeder, figs. 8 to 23, inclusive, has been the most popular of the several types developed by the Iowa Agricultural Experiment Station. It is simple in construction and manipulation; it is convenient; it is compact and low down; it is inexpensive to build; and it may be built in several sizes and forms. The large size, 8 to 14, inclusive, is practical for the feedlot, feed floor or pasture; the small single or small two-way may be used for small pigs or it may be used in the small pen or lot where a few pigs are kept.

#### THE LARGE SIZE TWO-WAY AMES SELF-FEEDER

This feeder, fig 11, requires a floor space of about 3x6 feet and stands about 4 feet high. The bin is larger at the top than bottom. An inverted "V" shape accelerator throws the grain toward the feed troughs, which are large and spacious.

Runners or skids may be used for sills, in order that it may be easily moved by a team or tractor. The roof overhangs a sufficient length to shelter the trough from rain, snow or summer sun.

The slides, figs. 10 (frontispiece), 11 and 12, are adjustable, being controlled by means of a bolt and thumb nut in a slotted hole. While the slides may be made the length of feeder, that is, one slide to a side, it is advisable to have two slides on a side for the large feeders (fig. 10). This permits partitioning the feeder into compartments for grain, tankage, etc.

The feed guards may be used as shown in figs. 9 and 14, or they may be left off en-

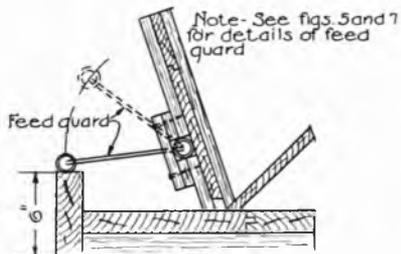


Fig. 9. Detail of automatic trough guard. Ames large self-feeder.

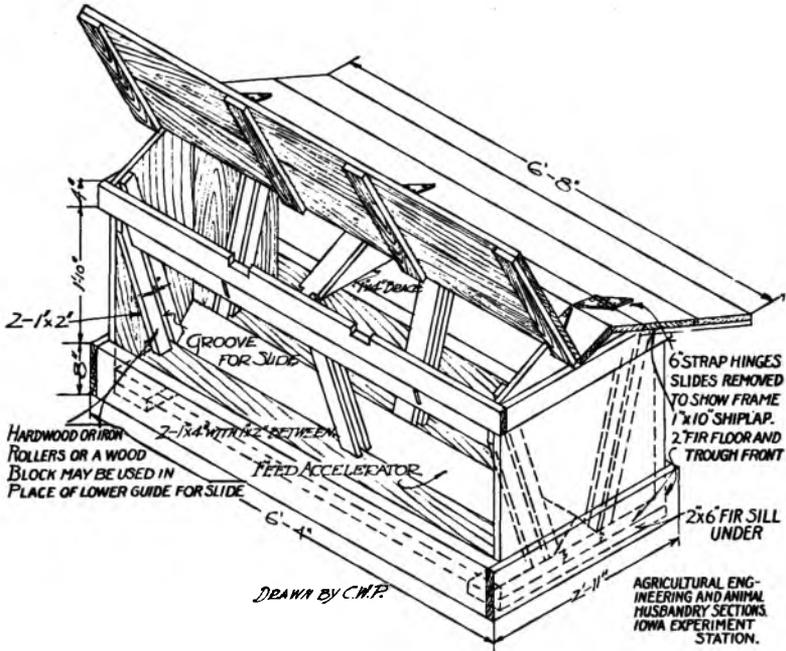


Fig. 11. Isometric drawing Ames large self-feeder.

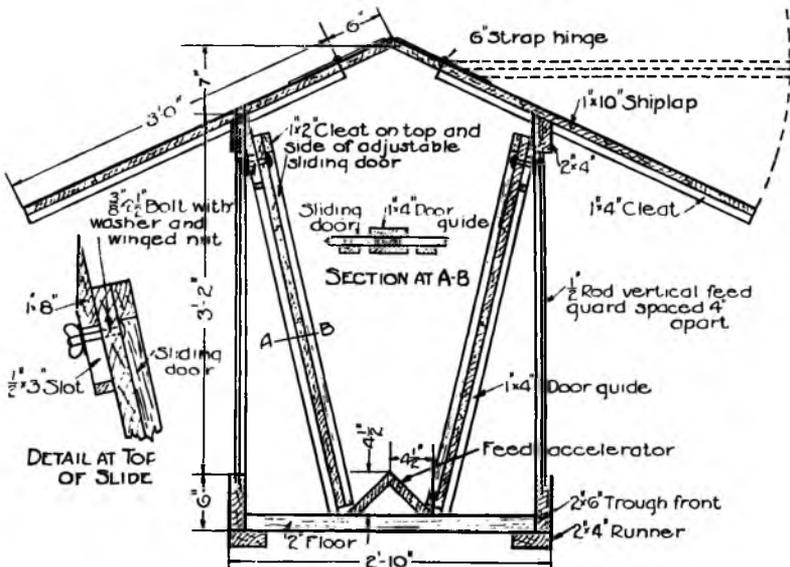


Fig. 12. Cross section Ames large self-feeder, showing end.

tirely. While the feed guard reduces waste, it increases the cost of the feeder and slightly complicates the construction. Since the materials, construction and posts of the self-feeder are common and are fully discussed under the Iowa Self-Feeder, they need no discussion under each type.

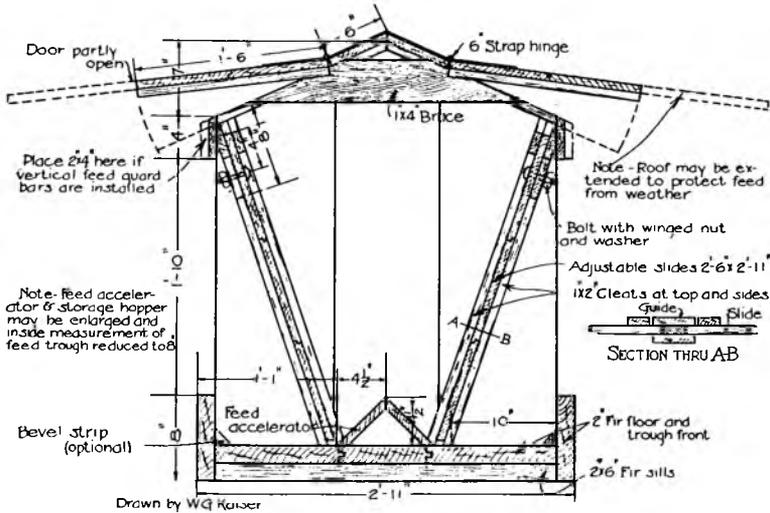


Fig. 13. Cross section Ames low-down self-feeder, showing center braces.

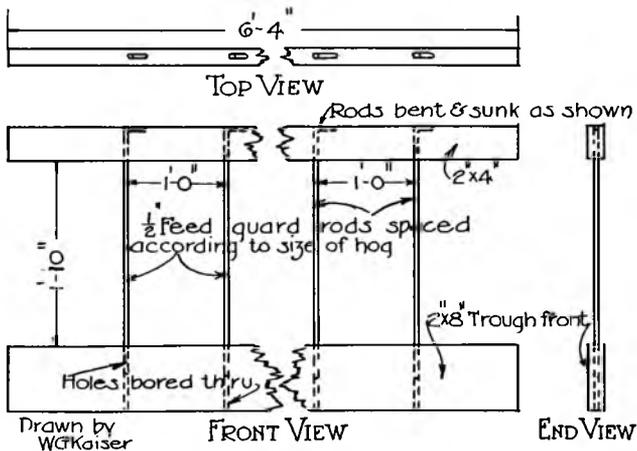


Fig. 14. Detail of rods and feed guard, Ames large self-feeder.

**BILL OF MATERIAL—AMES SELF-FEEDER LARGE,  
DOUBLE TROUGH (With Cover)**

1 pc. 2"x8"x12' No. 1 Fir for trough front  
 1 pc. 2"x12"x12' No. 1 Fir for floor  
 1 pc. 2"x8"x6' No. 1 Fir for floor  
 1 pc. 2"x6"x6' No. 1 Fir for sills  
 4 pcs. 1"x2"x16' W. P. Com.  
 4 pcs. 1"x4"x12' No. 2 W. P.  
 9 pcs. 1"x10"x12' No. 2 W. P. shiplap for sides, ends and roof  
 3 pr. 6" strap hinges  
 4  $\frac{3}{8}$ "x3" bolts with winged nuts and washers  
 4 lbs. nails  
 4 doz. 1 $\frac{1}{4}$ " No. 11 screws  
 $\frac{1}{2}$  gal. ready mixed paint to double coat 90 sq. ft.  
 Labor estimate, 10 hrs.

*Extras:*

Horizontal feed guard

24 ft. 1" black pipe  
 4 ft.  $\frac{3}{4}$ " black pipe  
 12 ft.  $\frac{3}{8}$ " wrought iron rod for feed guards, 4 $\frac{1}{2}$  lbs.  
 4 cotter pins  
 4  $\frac{3}{8}$ " nuts

Vertical feed guard

1 pc. 2"x4"x12' No. 1 W. P. for the upper horizontal support  
 20 ft.  $\frac{1}{2}$ " wrought iron rod for guards, 7 lbs.

Automatic trough cover

1 sheet 18-gauge iron 30"x26", 40 lbs.  
 4 pr. 4" strap hinges  
 12 ft.  $\frac{1}{2}$ " rod for hinge pin, 8 lbs.  
 12 ft.  $\frac{3}{4}$ "x $\frac{1}{4}$ " flat bar for curtain stiffener, 7.5 lbs.  
 Extra labor, 8 hrs.

**THE SMALL DOUBLE TROUGH AMES SELF-FEEDER**

This self-feeder, figs. 15 to 19, is similar to the large size feeder except it is made at a reduced size. The bin may be left single or it may be divided longitudinally as shown in cross section, fig. 17. This feeder is adaptable for the small feedlot, the show pen or for inside purposes.

**BILL OF MATERIAL—AMES SELF-FEEDER, SMALL  
DOUBLE TROUGH (With Cover)**

1 pc. 2"x12"x6' No. 1 Fir for floor  
 1 pc. 2"x6"x6' No. 1 Fir for runners  
 1 pc. 2"x8"x12' No. 1 Y. P. for trough front  
 2 pcs. 1"x2"x12' Com. for cleats  
 2 pcs. 1"x3"x10' Com. for cleats  
 1 pc.  $\frac{3}{8}$ "x $\frac{3}{8}$ "x12' No. 1 W. P. for guiding strip  
 4 pcs. 1"x10"x16' No. 2 W. P. shiplap  
 4 pr. 4" strap hinges  
 4 rollers  
 2  $\frac{3}{8}$ "x3" bolts with winged nuts and washers  
 2 lbs. 8d nails  
 10d nails and spikes  
 1 qt. ready mixed paint to double coat 60 sq. ft.  
 Labor estimate, 8 hrs.



Fig. 15. Ames self-feeder, small, double trough.

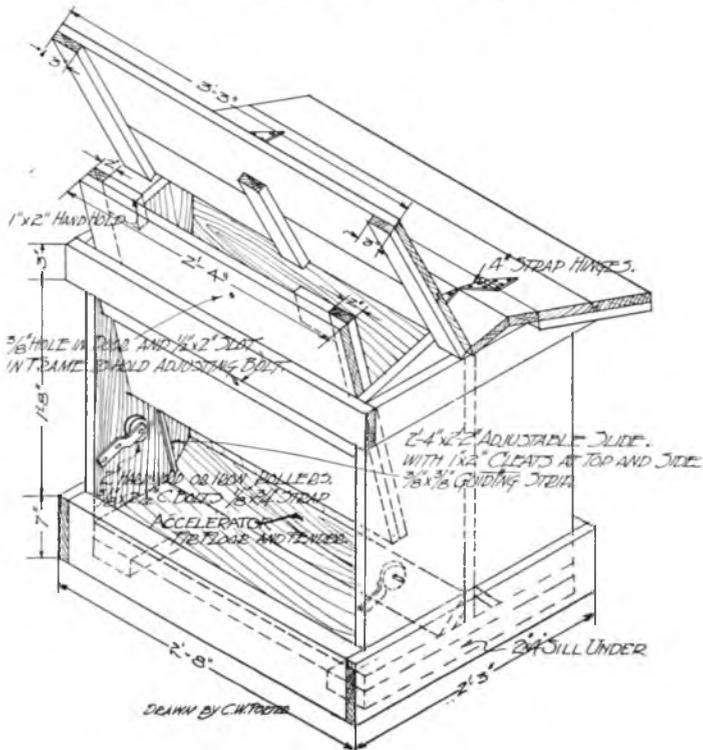


Fig. 16. Details of construction of Ames self-feeder, small size, two-w

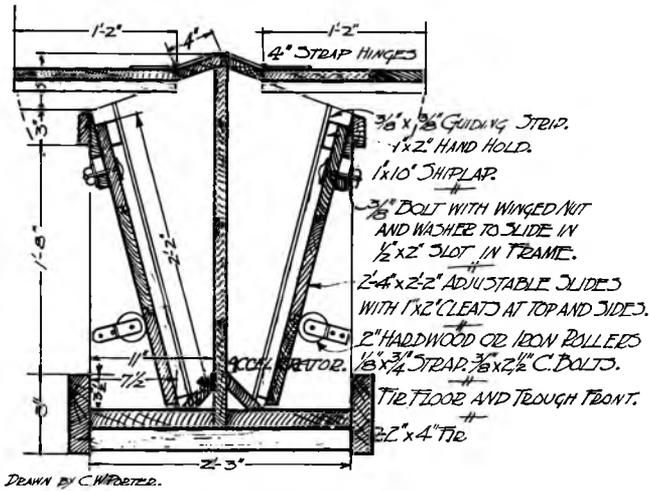


Fig. 17. Cross section Ames small two-way self-feeder.

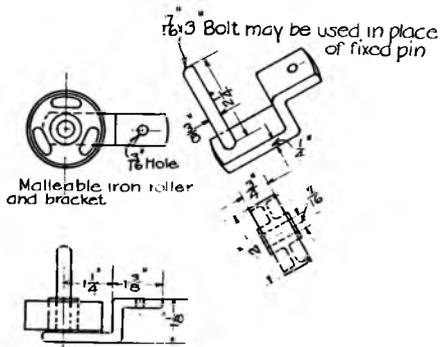


Fig. 18. Supports for slide, roller, blocks and props.

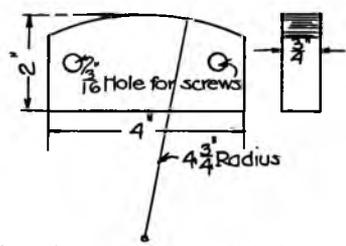
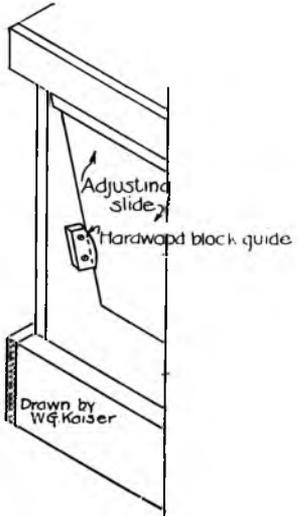


Fig. 19. Details of guide block for adjusting slide, Ames small self-feeder.

*Extras:**(Small Double Trough Ames Self-Feeder)*

## Horizontal feed guard

- 10 ft. 1" black pipe
- 4 ft.  $\frac{3}{4}$ " black pipe
- 6 ft.  $\frac{3}{8}$ " rod for feed guards,  $2\frac{1}{4}$  lbs.
- 4  $\frac{3}{8}$ " nuts
- 4 cotter pins

## Vertical feed guard

- 1 pc. 2"x4"x10' No. 1 W. P. for upper horizontal support
- 9 ft.  $\frac{1}{2}$ " rod, 6 lbs.

## Automatic trough cover

- 2 sheets 20"x28" 18-gauge sheet iron, 16 lbs.
- 2 pr. 4" strap hinges
- 4 ft. 8 in.  $\frac{1}{2}$ " rod for hinge pins, 3 lbs.
- 4 ft. 8 in.  $\frac{1}{4}$ "x $\frac{3}{4}$ " flat bar for curtain stiffener
- Extra labor, 8 hrs.

THE SMALL SINGLE  
TROUGH AMES  
SELF-FEEDER

This feeder, figs. 20 to 23, is of the same construction, shape and dimensions as the small two-way Ames self-feeder except that it is made single instead of double.

In building the above feeders, figs. 15, 16, 17 and 20, the slides may rest in a groove or they may be supported upon a roller or hardwood block as shown in figs. 18 and 19. The advantages of this support are simplicity of construction and preventing the slide binding in groove.



Fig. 20. Ames self-feeder, small, single trough, covered.

BILL OF MATERIAL—AMES SELF-FEEDER SMALL,  
SINGLE TROUGH (Without Cover)

- 1 pc. 2"x12"x2'-6" No. 1 Fir for floor
- 1 pc. 2"x8"x3' Y. P. for trough front
- 1 pc. 2"x4"x2' No. 1 Fir for runners
- 1 pc. 1"x2"x5' W. P. Com. for cleats
- 1 pc. 1"x3"x8' W. P. Com. for cleats
- 1 pc. 1"x12"x5' No. 2 W. P. for sides
- 1 pc. 1"x6"x8' No. 2 W. P. for sides
- 1 pc. 1"x10"x16' No. 2 W. P. shiplap for sides
- 1 pc.  $\frac{3}{8}$ "x $\frac{3}{8}$ "x6' W. P. guiding strip (No. 1 W. P.)
- 1 lb. 8d nails
- 1 lb. 10d nails

- ½ lb. 6d nails
- ½ lb. 20d nails
- ¾" x 2½" bolt with winged nut and washer
- 2 rollers
- 1 pint ready mixed paint to double coat 30 sq. ft.

*Add for cover:*

One-way with cover

- 1 pc. 1" x 10" x 6' No. 2 W. P. shiplap
- 1 pc. 1" x 2" x 2'-6" board com.
- 2 pr. 4" strap hinges
- Chain 2' long with staples
- Labor estimate, 5 hrs.

*Extras:*

Horizontal feed guard

- 5 ft. 1" black pipe
- 2 ft. ¾" black pipe
- 3 ft. ¾" rod for feed guards, 1½ lb.
- 2 ¾" nuts
- 2 cotter pins

Vertical feed guard

- 1 pc. 2" x 4" x 2'-6" No. 1 W. P. for upper horizontal support
- 4 ft. length ½" rod for guards, 3½ lbs.

Automatic trough cover

- 1 sheet 18-gauge iron 20" x 28", 8 lbs.
- 1 pr. 4" strap hinges
- 2 ft. 4 in. flat bar ¼" x ¾", 1.5 lbs.
- 2 ft. 4 in. ½" rod for hinge pins, 2¾ lbs.
- Extra labor, 8 hrs.

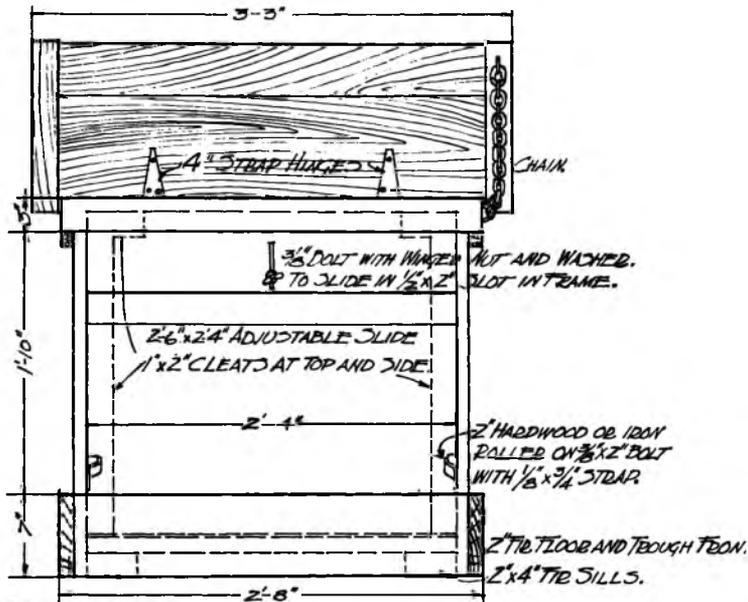


Fig. 21. Front elevation, Ames small one-way self-feeder.

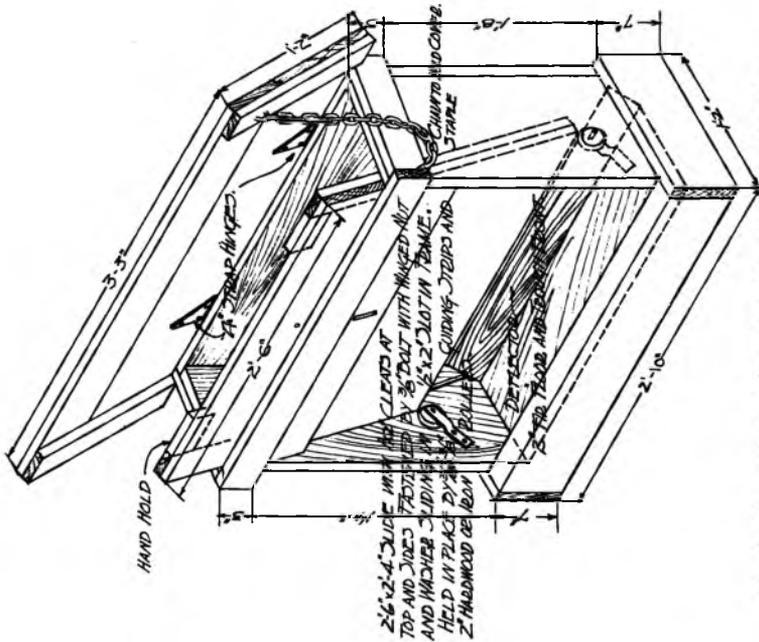


Fig. 22. Isometric drawing of small one-way self-feeder.

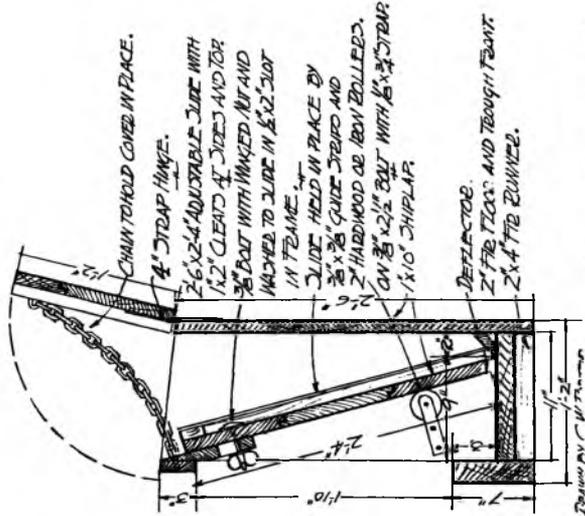


Fig. 23. Cross section Arms: small, one-way self-feeder.

## THE HANDY SELF-FEEDER

This feeder, shown in figs. 24 to 29, inclusive, is of a different type. It consists of two bin compartments. The storage bin is placed over and empties into the feed bin, fig. 26. The feed flow from large bin to feed bin is controlled by means of a slide valve, figs. 27, 28 and 29. This slide is made of a 4-inch hardwood board in which 2-inch holes are bored four inches apart. This slide rests in a similar fixed board and is controlled by a lever. When the holes of the slide are brought into alignment or partially overlap the holes in the fixed board, the grain runs or flows into the feed compartment below.

This feeder may be used when it is desirable to regulate the consumption or when the herd is becoming accustomed to the self-fed plan.

This feeder is built of the same materials as used in the other feeders. While a double or "two-way" feeder is shown, it may be built single trough or "one-way." The cover, troughs, and accelerator are similar to those used on the other feeders.

### BILL OF MATERIAL—THE HANDY SELF-FEEDER

- 1 pc. 2"x8"x12' No. 1 Fir for trough front
- 1 pc. 2"x10"x12' No. 1 Fir for floor
- 1 pc. 2"x4"x10' No. 1 Fir for sill
- 1 pc. 2"x2"x3' Com. for lever
- 1 pc. 1"x2"x12' W. P. Com. for cleats
- 6 pcs. 1"x10"x12' No. 2 W. P. shiplap
- 1 pc.  $\frac{3}{8}$ "x4"x3'-6" maple or white oak for slide
- 1 pc.  $\frac{3}{4}$ "x4"x3'-6" maple or white oak for slide



Fig. 24. Handy self-feeder, open.

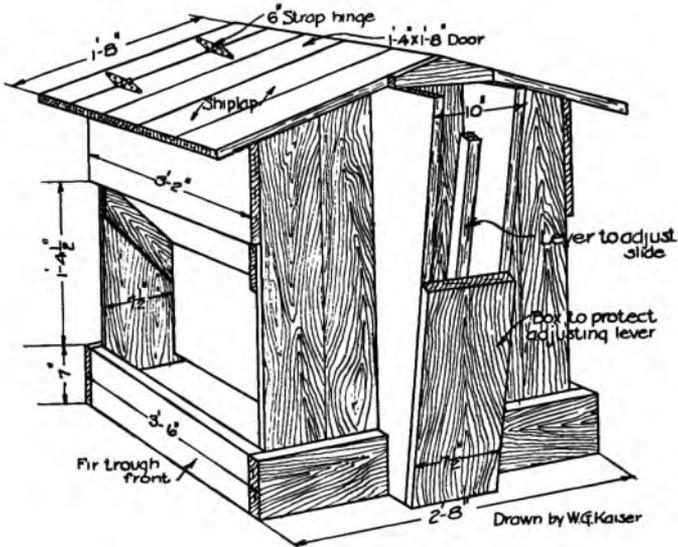


Fig. 25. Perspective of handy self-feeder.

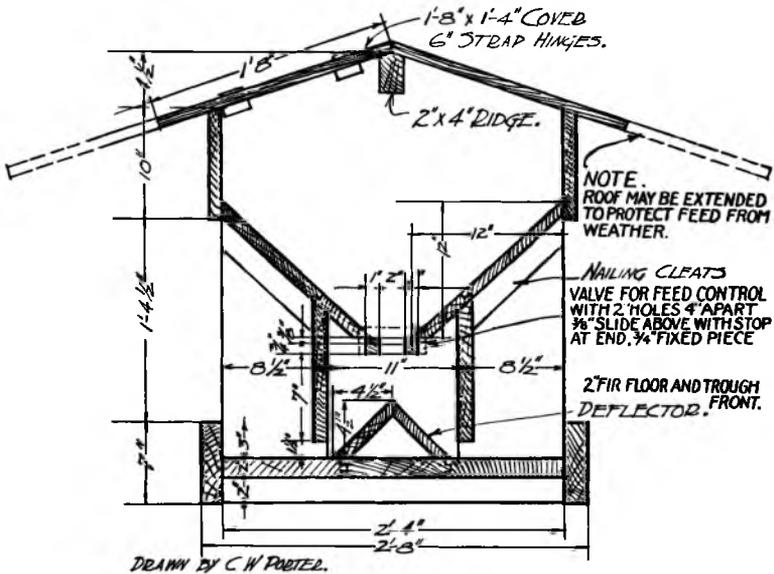


Fig. 26. Cross-section of handy self-feeder.



- 1  $\frac{3}{8}$ "x3" bolt with nut and washer
  - 2  $1\frac{1}{2}$ " staples
  - 2 pr. 6" strap hinges
  - 2 lbs. 8d nails
  - 1 lb. 10d nails
  - 1 lb. 20d spikes
  - 1 doz. No. 11 screws  $1\frac{1}{4}$ " long
  - 1 qt. ready mixed paint to double coat 60 sq. ft.
- Labor estimate, 10 hrs.

*Extras:***Horizontal feed guard**

- 12 ft. 8 in. of 1" black pipe
- 4 ft.  $\frac{3}{4}$ " black pipe
- $\frac{3}{8}$ " rod for guards
- 4  $\frac{3}{8}$ " nuts
- 4 cotter pins

**Vertical feed guard**

- 1 pc. 2"x4"x6'-4" for upper horizontal support
- 8 ft.  $\frac{1}{2}$ " rod for guards, 5 lbs.

**Automatic trough cover**

- 2 sheets 18-gauge sheet iron 16"x36", 8 lbs.
  - 2 pr. 4" strap hinges
  - 6 ft.  $\frac{1}{4}$ "x $\frac{3}{4}$ " flat bar, 4 lbs.
  - 6 ft. 6 in.  $\frac{1}{2}$ " rod for hinge pins, 4 $\frac{1}{4}$  lbs.
- Extra labor, 8 hrs.

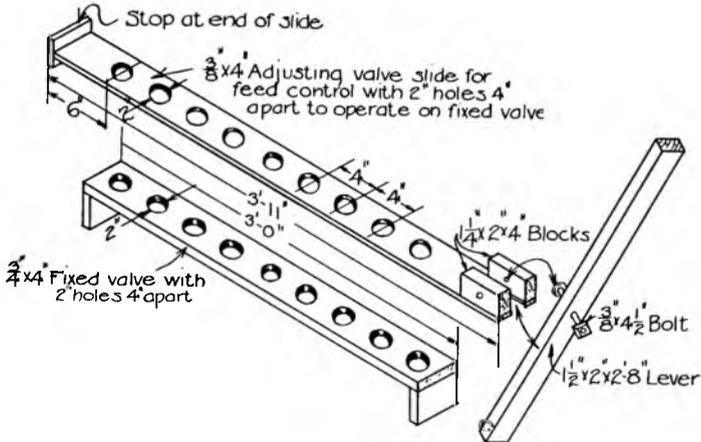


Fig. 29. Details of feed control valves.

## THE ECONOMY EAR CORN SELF-FEEDER

The success of the self-feeder for small grain and concentrates created a demand for an ear corn self-feeder. The Economy Ear Corn Self-Feeder, figs. 30 to 35, inclusive, was developed to meet this requirement.

This feeder (fig. 30) consists of a bin set on a platform. A cover, which extends over the sides, shelters the bin and adjustable slides on the four sides. The accelerator forces the ears of corn to the sides, where they are within reach of the feeding swine.



Fig. 30. The Economy ear corn self-feeder.

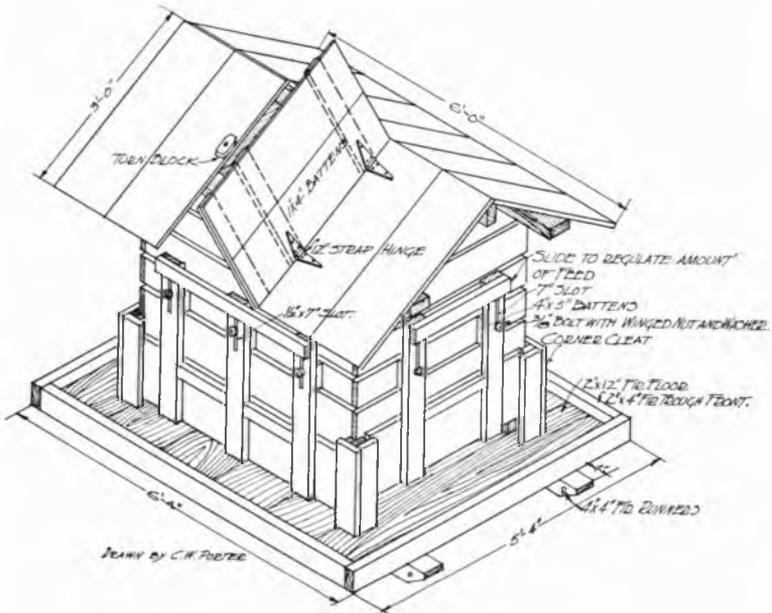


Fig. 31. Isometric view of the Economy ear corn self-feeder.

## PLATFORM

The platform, figs. 31 and 33, is shown 5 ft. 4 in. by 6 ft. 4 in., built into a tight floor of 2-inch material, which rests upon 4x4 sills or runners. Two by four trough fronts prevent the corn ears rolling off the platform.

## THE BIN

Unlike the bins of the small grain feeder which are built of shiplap or matched material, the bin is built by nailing cribbing or plain boards to the frame. The cracks formed between boards allow ventilation. The frame work, fig. 33, of bin is made of 2x4 material and the uprights are toe nailed to the floor.

## THE ACCELERATOR

The accelerator, fig. 35, is made similar to the hip roof, that is, it slopes towards each wall or side.

## BILL OF MATERIAL—ECONOMY EAR CORN SELF-FEEDER

- 1 pc. 4"x4"x14' No. 1 Fir for runner
- 3 pcs. 2"x12"x10' No. 1 Fir for floor
- 1 pc. 2"x4"x10' No. 1 Y. P. for trough front
- 1 pc. 2"x4"x12' No. 1 Y. P. for trough front

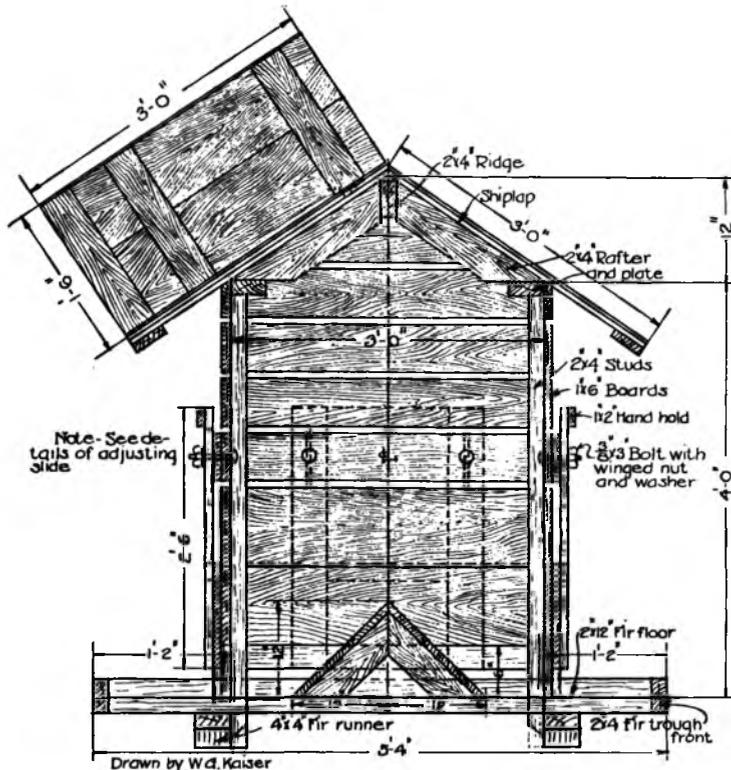


Fig. 32. Cross section Economy ear corn self-feeder.

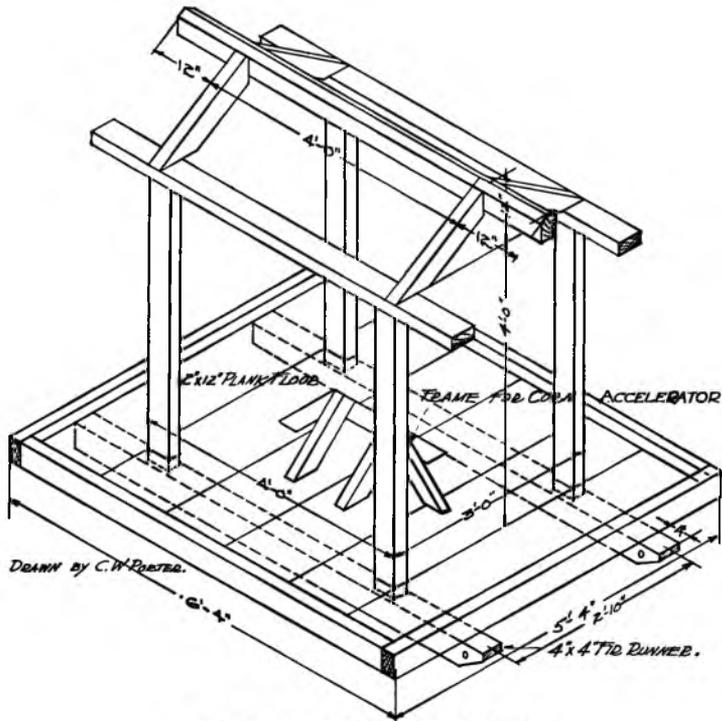


Fig. 33. Isometric drawing of frame.

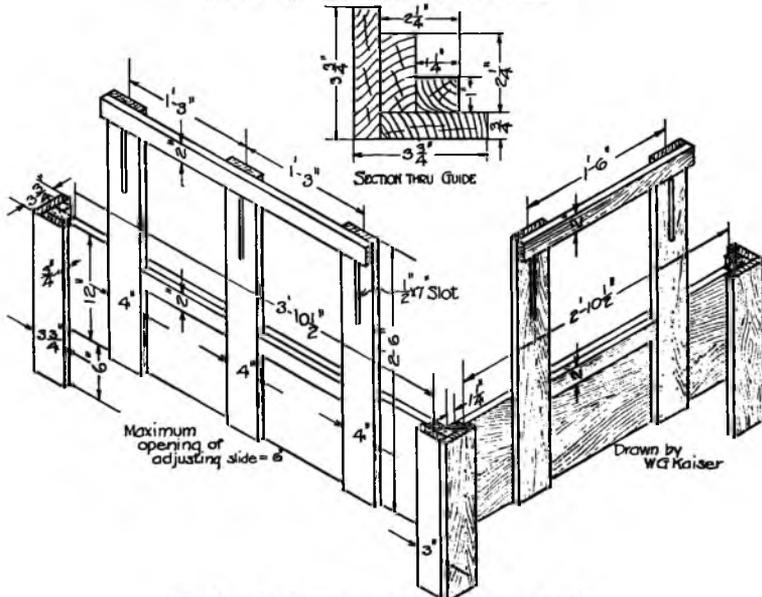


Fig. 34. Details Economy ear corn self-feeder.

- 4 pcs. 2"x4"x16' No. 1 W. P. for framing
  - 3 pcs. 1"x10"x12' No. 2 W. P. shiplap
  - 3 pcs. 1"x4"x16' No. 2 W. P. for corner cleats and slides
  - 6 pcs. 1"x6"x14' No. 2 W. P. for siding
  - 2 pcs. 1"x12"x14' No. 2 W. P. board for slides and base
  - 2 pcs. 1"x2"x12' Com. strips
  - 1 pc. 1"x1 $\frac{1}{8}$ "x10' W. P. strip
  - 1 pc. 1 $\frac{1}{4}$ "x2"x10' W. P. strip
  - 5 lbs. 8d nails
  - 3 lbs. 16d nails
  - 2 6" strap hinges
  - 10  $\frac{3}{8}$ "x3 $\frac{1}{2}$ " bolts with winged nuts and washers
  - 1 qt. ready mixed paint
- Labor estimate, 15 hrs.

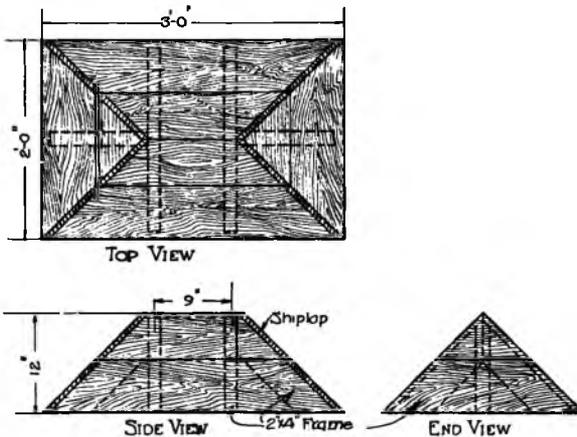


Fig. 35. Details of corn accelerator.

## LARGE COMBINATION SELF-FEEDER

This feeder, shown in figs. 36 and 37, is similar to the small self-feeder except that the bin is large and will hold 200 bushels or more of small grain. In construction it is similar except the frame is heavier, which must be more rigid to hold the large quantity of stored grain.

Fig. 36 shows this feeder in actual use in an Iowa feed lot. It is 12 feet long, 8 feet wide and about 10 feet high. This is sufficiently large to accommodate 240 or 250 pigs. Fig. 37 shows cross section of this feeder, built slightly differently than the one in fig. 36, in that it is stronger and well braced. Since the grain bin is high, it is absolutely necessary for strength and stability to have feeder strongly built so it will not rack or upset easily.

The doors on the side, shown in fig. 37, shelter the troughs from snow and rain. By opening and fastening in a horizontal position, they shade troughs from sun's heat in summer.

The size of the opening or throat will depend upon the kind of grain served in the feeder. The two-inch throat should readily handle smooth grain such as shelled corn, but it would be too small for oats, ground feed or tankage. The feeder should use his judgment in determining the size of throat in order to meet his requirements.

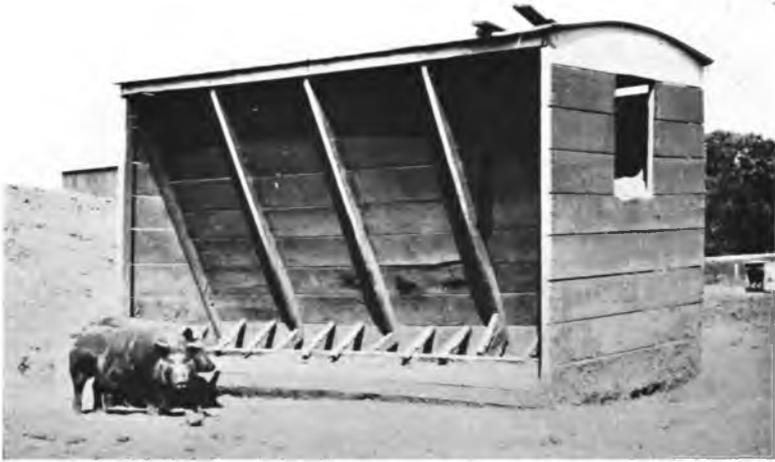


Fig. 36. Large combination self-feeder.

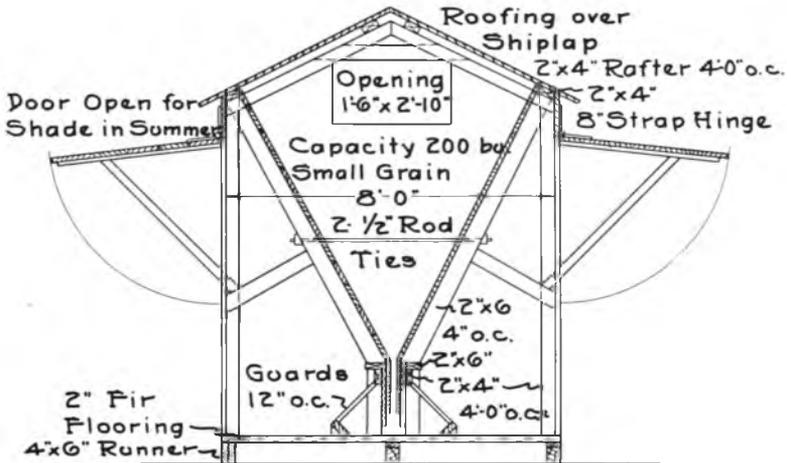


Fig. 37. Cross section of large self-feeder.

**BILL OF MATERIAL—LARGE SELF-FEEDER**

3	pcs. sills	4"x6"x14'-0"
15	pcs. floor	2"x10"x8'-0"
2	pcs. trough front	2"x6"x12'-0"
8	pcs. studs	2"x4x1'-4"
2	pcs. plate	2"x4"x12'-0"
2	pcs. plate	2"x6"x12'-0"
8	pcs. bin girts	2"x6"x7'-0"
6	pcs. bin braces	2"x4"x2'-3"
8	pcs. studs	2"x4"x8'-0"
2	pcs. plates	2"x4"x12'-0"
2	pcs. purlins	2"x4"x12'-0"
8	pcs. rafters	2"x4"x4'-6"
2	pcs. slides	1"x12"x12'-0"
22	pcs. bin boards	1"x10"x12'-0" shiplap
12	pcs. sides	1"x10"x12'-0" shiplap
24	pcs. ends	1"x10"x8'-0" shiplap
18	pcs. 1"x1"	oak guards 1'-6" long
4	pr. 8"	strap hinges and screws
2	pr. 4"	strap hinges and screws
2	rods	½"x4'-8", threaded bolt ends and nuts
8	bolts	¾"x2½" with wing nuts
4	lbs. 20d	nails
3	lbs. 8d	nails
3	lbs. 6d	nails
3	rolls	3-ply roofing
1	gal. paint	(house)
	Labor,	30 hrs.

**EAR CORN SELF-FEEDER FOR CRIB**

In order to feed swine profitably, the herd is usually finished at or near the crib. This is done by feeding in a lot adjoining the crib or on a concrete feed floor built at the side of the crib. The grain must be handled by scooping or carrying the grain to the feeding floor. To reduce this labor the ear corn self-feeder attachment shown in figs. 38, 42 and 44 may be built.

A single crib with sheltered feed floor is shown in figs. 38 and 39. This floor may be used for finishing hogs in season or it may be used for a cattle shelter at other times. Storage may be secured in loft for straw or roughage. A trough for grain is readily constructed over frame work for feeder. Large doors are placed in ends for driving thru shelter for cleaning out.

A double crib with feeder attachment is shown in figs. 40 and 41. This may be the double crib with lean-to shed at side, or if considerable mow space is desired, it may be built similar to a barn.

The ear corn self-feeder, figs. 42 and 44, is divided into 4-foot sections. The partitions between sections tie the front of feeder to the crib. The bottom board is ten inches wide and extends from the plate to the front of feeder to support the trough front. Two by fours four feet apart extend from this board at an angle of 60 degrees to support front of feeder. Another member of the same size ties feeder front to studding of crib. The front of feeder may be made of slides as used in the small self-feeder or it may consist of narrow boards as shown in cross-section. This simplifies the construction and the opening may be made to suit individual requirements. In case of the corn bridging behind studding, it may be broken by ramming with a bar or piece of pipe. Furthermore, it may be desirable to have a spacing between boards on feeder front so pipe may be inserted for breaking bridging of corn.

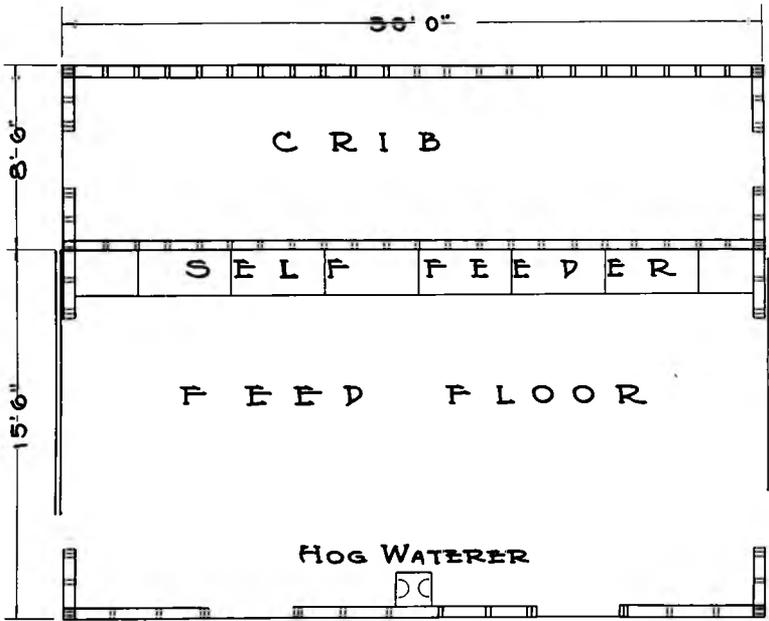


Fig. 38. Plan of feed floor, crib bin and ear corn self-feeder.

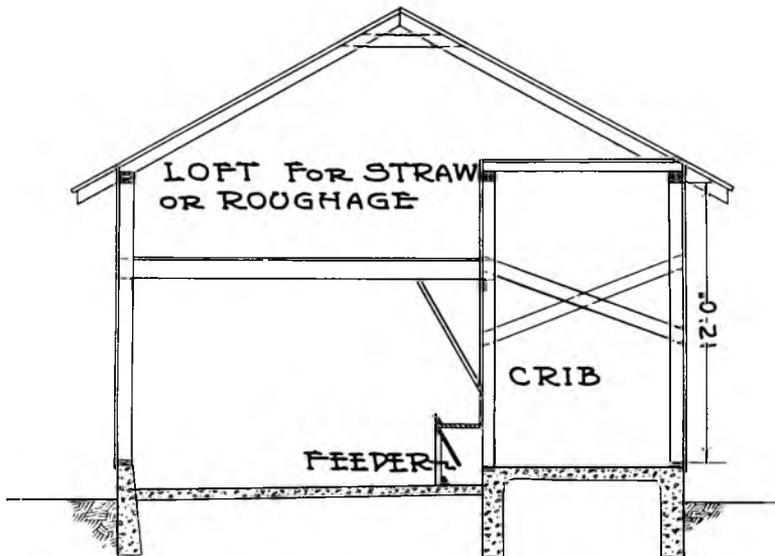


Fig. 39. Cross section feed floor, crib bin and ear corn self-feeder.

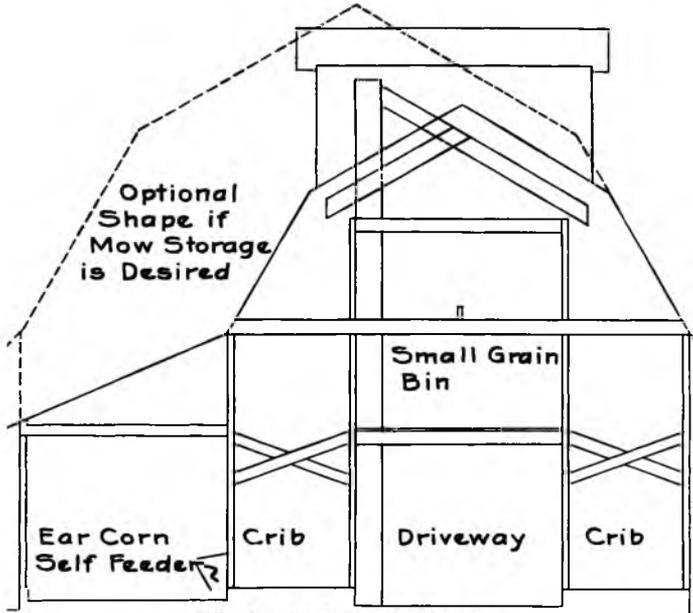


Fig. 40. Section of double crib.

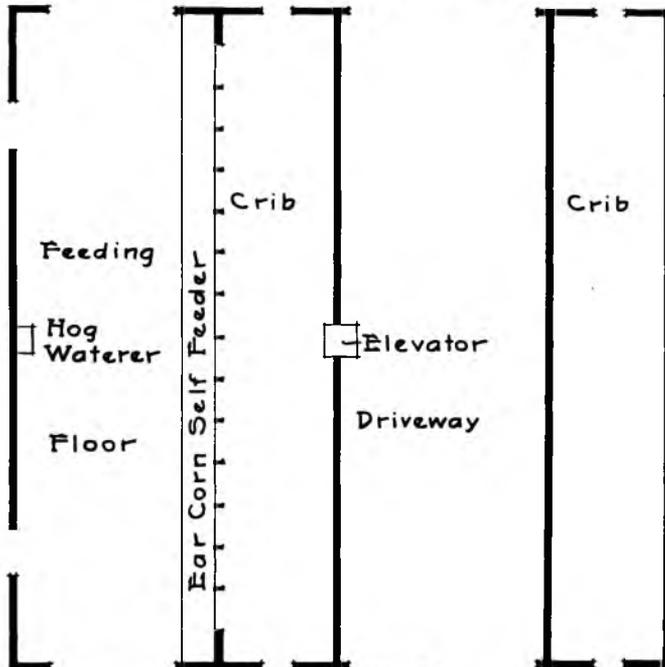


Fig. 41. Plan of double crib.

This attachment has been in use by prominent feeders for the past five years. They report splendid service in their use.

### SELF-FEEDER BIN SHAPES

While any shape bin may be used in a self-feeder, the one which is simple in construction, convenient, accessible for both serving and feeding is desirable. An alternate bin shape is shown in fig. 43.

A sewer tile with hub down, resting on low blocks set in a shallow box platform, may be used for a self-feeder. An inverted funnel or cone may be set in center to throw grain towards edge. A simple cover is made by inverting a galvanized basket over tile to keep out the weather and birds.

### LEAK-PROOF COVER

Since the self-feeder is usually used in the feedlot where it is exposed to the elements, a leak-proof roof is desirable. A leaking cover or roof causes grain to sprout and clog in the throat of the feeder. If ground grain is fed, moisture will cause lumps and mold which choke the feeder.

To avoid leaking the cover must be constructed carefully and be kept well painted or covered with a roofing material, such as prepared roofing. The single and two-way feeder with hinged cover require a special construction, such as is shown in fig. 45, to prevent leaking.

### FEED ACCELERATOR

The inverted trough accelerator is usually satisfactory, but frequently damp grain is placed in the feeder, such as green oats or moist corn, and some difficulty is experienced by grain molding or clogging in throat of feeder. A simple automatic accelerator may be quickly made by inserting a piece of wire fencing in feeder bin and allowing it to extend thru throat into trough, fig. 46. The feeding pigs move fencing and this constant movement keeps throat from choking up. This wire is fastened, stapled at top and hangs loosely in bin and trough.

Chains, hanging loosely in the bin and throat, have been successfully used as an agitator to keep grain flowing. Old trace chains, pump chains or discarded tire chains may be used. The chain should be fastened at the top of bin and hang freely so it would extend to the front of the trough. Two or more chains should keep feeder throat open.

The New Jersey accelerator or throat construction is shown in fig. 47. The value of this throat is that the feeding animal can keep the throat free unless moist or lumpy feed should cause bridging.

### CONTROL OF SLIDES

The throat opening depends upon position of bin front or slide. Since the most common method of control is the wing nut bolt as used in the Iowa and Ames self-feeders, it does not follow that other methods may not be used. While only one other method is shown in figs. 48 and 49, the builder may design simple controls to suit his convenience.

The method shown in figs. 48 and 49 is merely a fixed screw which is turned by bending a crank on the end as shown. This screw is fixed by drilling a small hole thru rod and placing a cotter pin thru hole and a washer on each side *a*, fig. 49. Since the washers are confined between legs of upper bracket, the screw is fixed. The screw thread meshes in tapped hole of hanger on adjustable board. By turning screw, this board is raised or lowered as desired. This method has been successfully used to control the fanning mill upper throat opening.

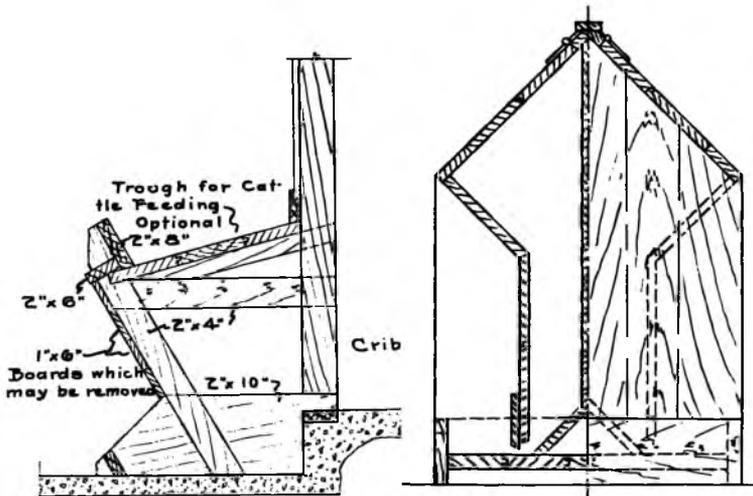


Fig. 42. Cross section ear corn self-feeder attached to crib.

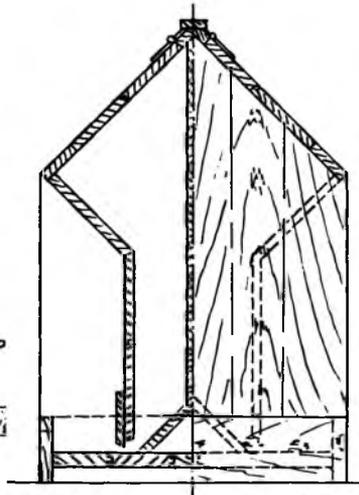


Fig. 43. Cross section alternate bin.

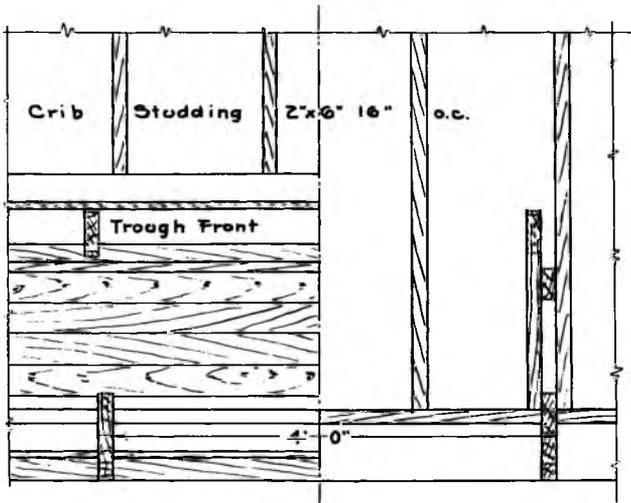


Fig. 44. Front elevation, boards removed, ear corn self feeder attached to crib.



Fig. 45. Cross section, leak proof cover construction.

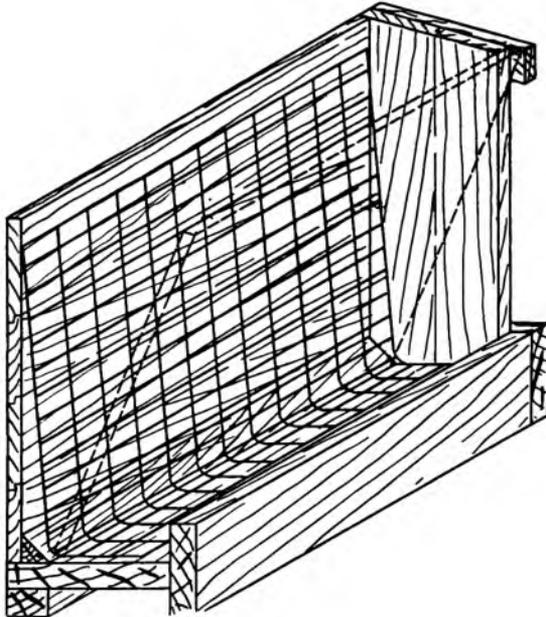


Fig. 46. Wire fencing used as automatic accelerator.

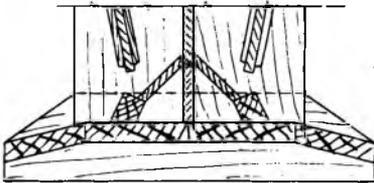


Fig. 47. Cross section of New Jersey accelerator.

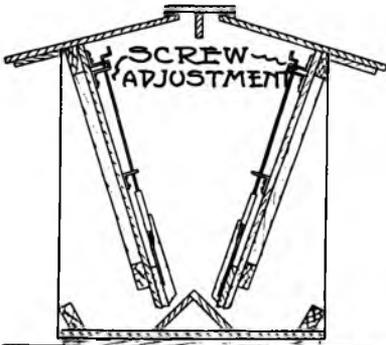


Fig. 48. Sectional view of self-feeder with screw adjustment for throat.

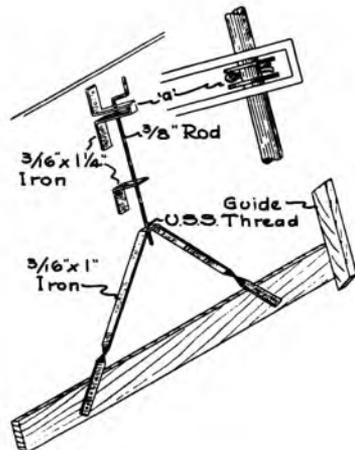


Fig. 49. Detail of screw adjustment.

