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Plans For Small Barns

By

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getting the animals in and out of the barn, filling the hay loft, and the best location of the silo, keeping in mind both the interior feeding arrangements, the yards around the barn, and the necessary space for engine, cutter, and wagons when filling the silo.

Economy is a very important item in barn planning. If a satisfactory barn can be built for \$100 a cow, it is poor business to build at a cost of \$250 per cow. The smaller the first cost, providing the barn is durably built, the easier it is to make the investment pay. Often the feed passages and alley ways are unnecessarily wide or the ceiling too high. Many barns have more loft space than they need. If the loft is only half filled each year, the stock have to make a profit on an unnecessary expenditure which is not only of no benefit, but increases the taxes, the insurance, and the upkeep item.

The following are important items to keep in mind when planning a barn: location of barn so as to have good drainage, convenient location of the feed passages, doors, feed room, grain bins, hay and grain chutes, water troughs, stair to loft, harness storage, milk house; provision for future silo, for possible extension in the size of the barn, for feed and litter carriers; and location of posts and girders to give the most economical length of loft joist, and to fit in with the stall partitions, box stalls, and feed passages and alley ways of the stable.

THE SMALL BARN

In a great many parts of the state and especially in the fruit and vegetable growing sections, the farms are small, and two horses are sufficient to do the work on the land. From these districts especially, and from the towns, many inquiries for small barns capable of housing several horses and cattle are received. These cases do not call for a very large barn. One sixteen feet in width will do for ordinary purposes. Figure 1 shows a barn capable of housing comfortably two cows and one horse. It allows ample space for hay storage and room for a sufficiently large grain box for three or four animals. The feed storage space may be used

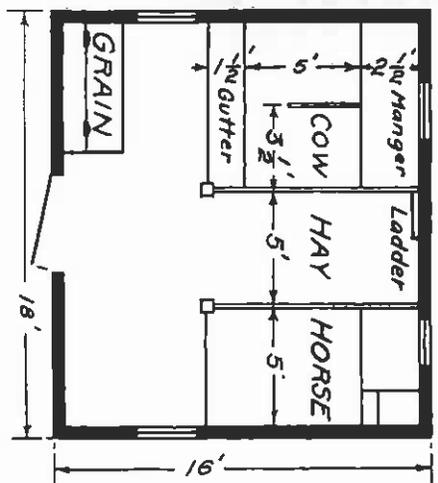


Fig. 1

temporarily to stall an additional horse or cow. Figure 2 shows the plan of a barn for two horses and one cow. This is quite similar to Figure 1. In case space for another cow or horse is required, the hay space may be used permanently for that purpose and the ladder to the loft placed behind the animals. Many farmers would prefer having hay chutes from the loft to each manger. This arrangement could easily be secured in these plans.

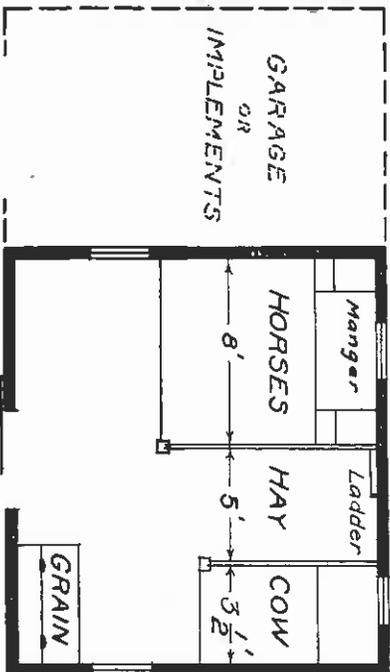


Fig. 2

The dotted lines to the left indicate a possible addition for storage of small implements or a car. On many fruit ranches, it is customary to house the implements and car under the same roof with the stock. Figure 3 shows a plan for two cows and a large roof stall which could be used for calves or a bull or a stallion. Figure 4 is a plan for a barn accommodating three cows and allows ample space for a good box stall. It also has sufficient room for grain and for hay storage. Any of these plans may be made longer

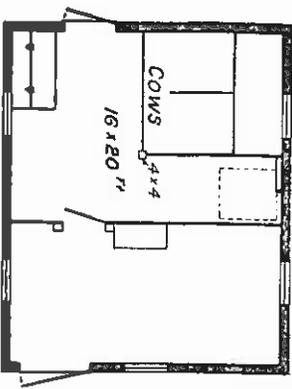


Fig. 3

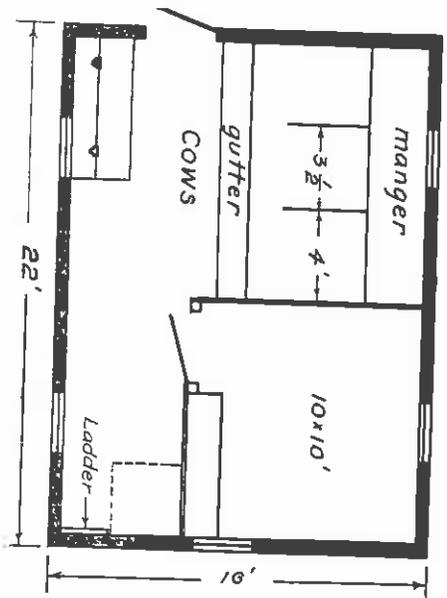


Fig. 4

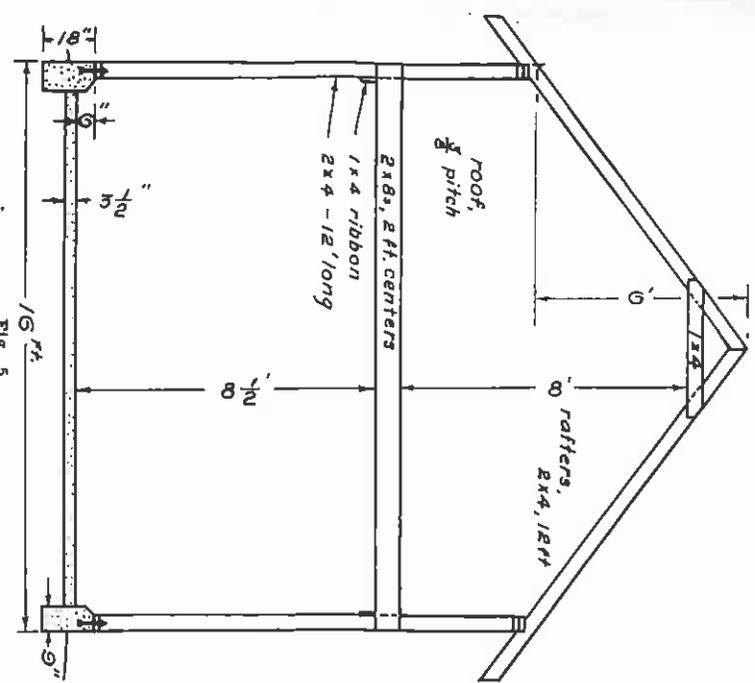


Fig. 5

to care for any number of cattle or horses. It is customary to allow 4 feet for single stalls for large cattle and 5 feet for horses. The framework of these small barns is shown in figure 5. The pitch of the roof is three-eighths, which makes possible the use of 2x4s, 12 feet long for rafters. The studding, rafters and joists are placed two feet on centers. With 12 foot studding, there is a considerable loft space above the stable for hay storage. This is a simple type of barn and one that almost any farmer can build himself. In case it is desired to have a feed passage in front of the animals, these barns could be made 18 or 20 feet wide, instead of 16. The plan, shown by figures 6 and 7, has single stalls for eight dairy cows but can be made any length. It makes a very compact

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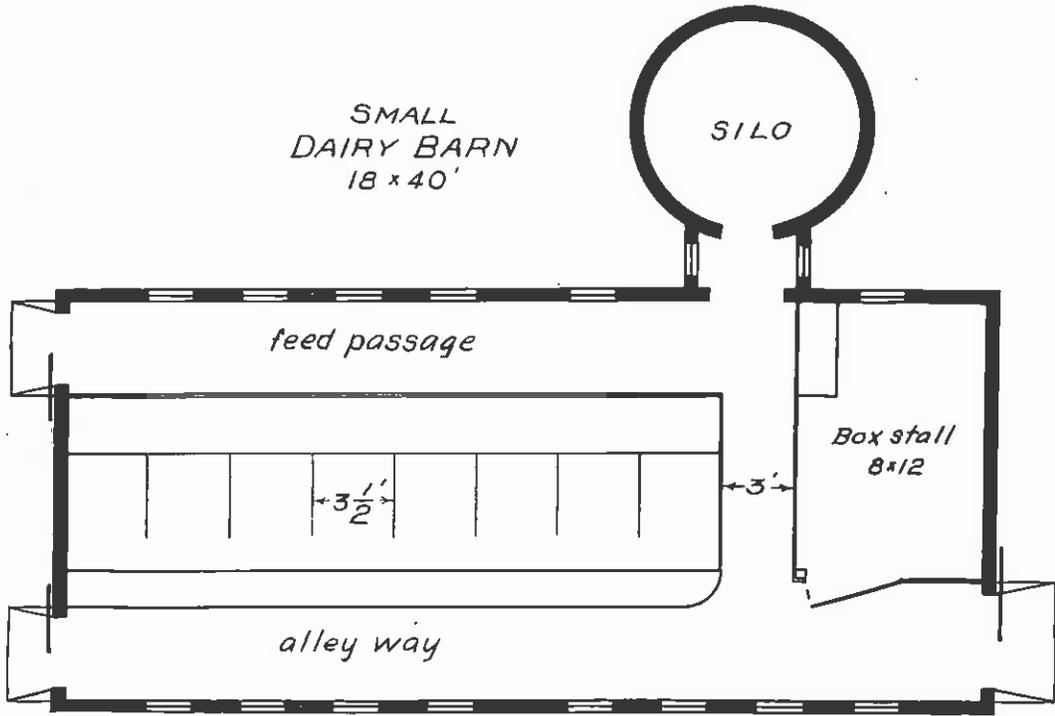


Fig. 6

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FIG. 8

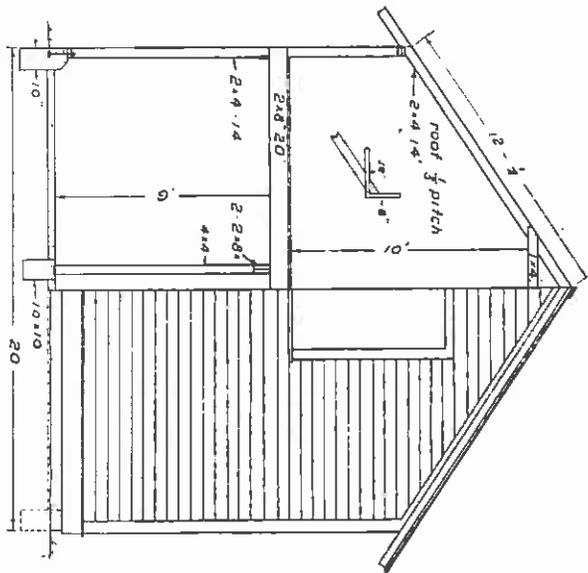
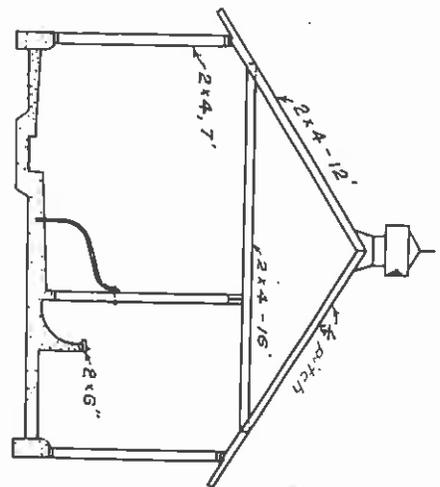


FIG. 7



and inexpensive little dairy barn. It can have a loft by using 12 or 14 foot studdings. The framework for the 20 feet wide barns is shown in figure 8. The roof in this figure is 1-3 pitch, which makes possible the use of 2x4s 14 feet long for rafters. The loft space in the 20 foot barn is over 50% greater than that in the 16 foot barn.

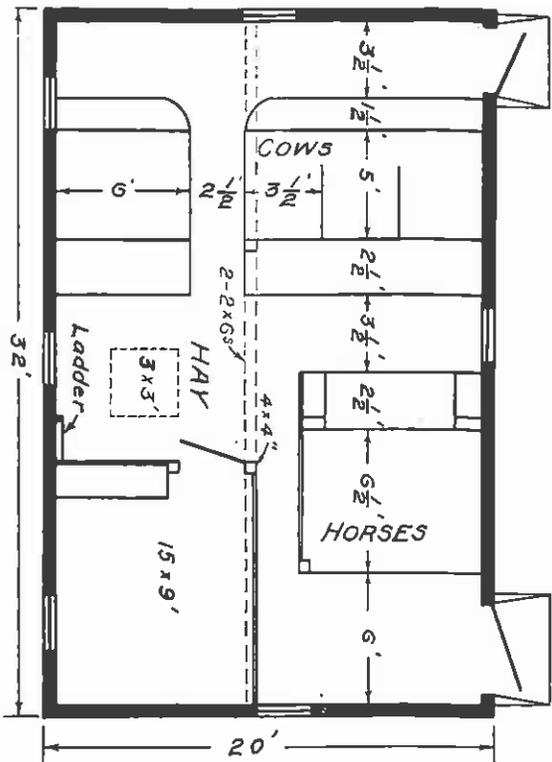


Fig. 9

Figure 9 shows a barn 20x32 feet, which is capable of housing two horses and 5 cattle. It also provides a large box stall and ample feed room space. The passage way between the horse stall and the box stall is purposely made narrow so that horses cannot get through. The girders, built up of two 2x6s can be run through nearly the center of the barn, and support the 20 foot joists. This is a very economical and convenient type of barn for the number of stock that it is capable of housing.

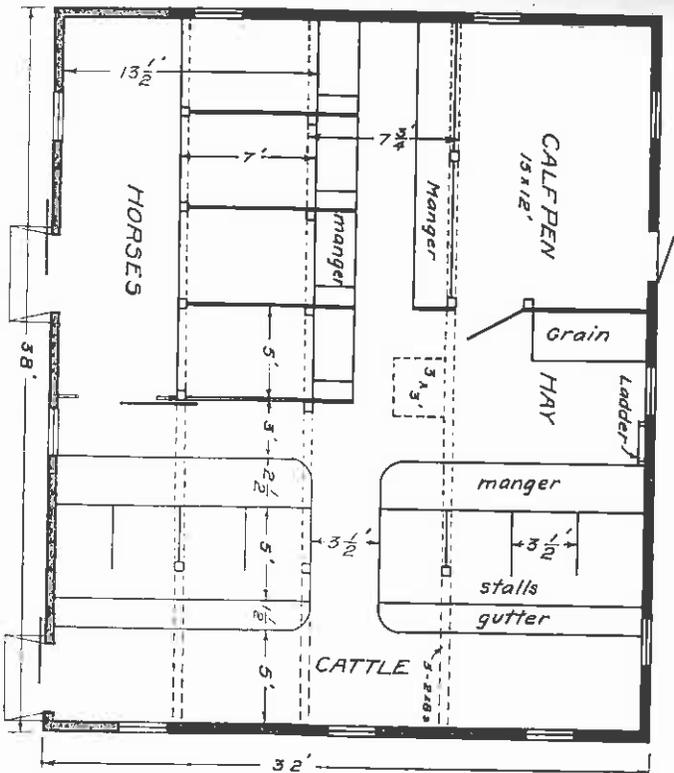


Fig. 10

MEDIUM SIZED BARN

Figure 10 shows a barn which will care for 8 cattle and 4 horses with a large calf pen in addition. This plan is very convenient and economical. The horse section can be almost entirely closed off from the part devoted to cattle which is an item worth considering. The horses and cattle enter the barn by separate doors as in figure 9. It is usually better to have the two doors on the same side of the barn. One objection to the barn where the stalls run across its width, is that it is very difficult to add to the barn. The last two plans will illustrate this point.

Figure 11 shows a very attractive general purpose barn where the major space is used for cattle. The plan shows accommodation for four horses; but by doing away with the harness and grain space

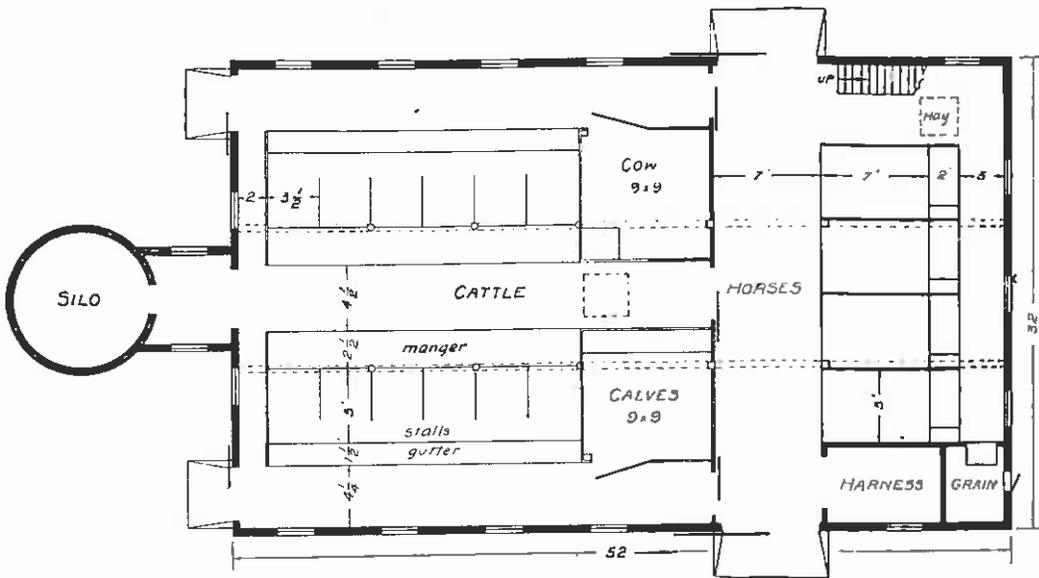


Fig. 11

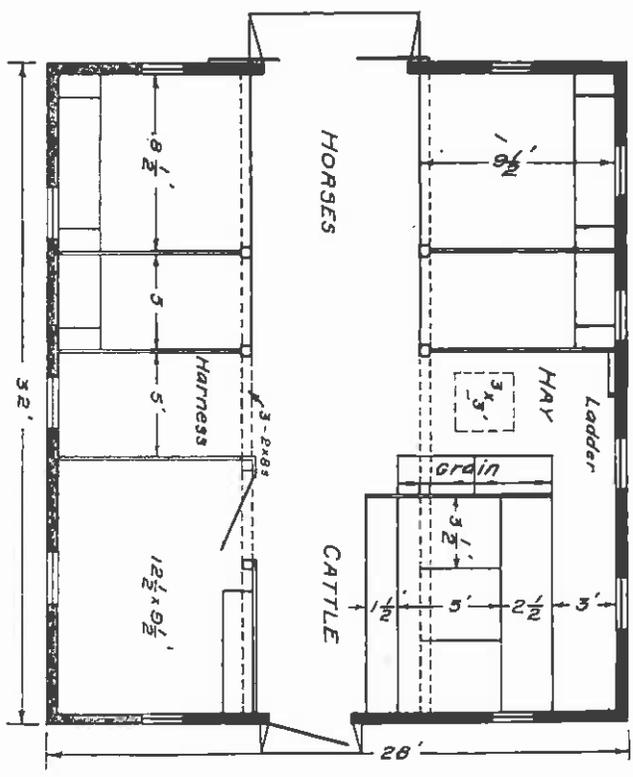


FIG. 12

or the hay storage space at the opposite end, room for one additional horse could be provided in this barn. The horse area is entirely separate from the dairy cattle. While the plan shows twelve single stalls, the barn can be made any length to accommodate the desired number of cattle. This is one of the advantages of the two row type barn over the type barn where the rows of stalls run across its width. Thirty-two feet is an economical width for the two row type dairy barn. Many build such a barn 34 or even 36 feet in width. This allows more space for the feed passage and alley ways, and considerable additional loft space; but the thirty-two foot barn is more economical in first cost and in upkeep.

The narrowest of the medium sized barns is twenty-eight feet in width. The barn illustrated in figure 12 has a capacity of six

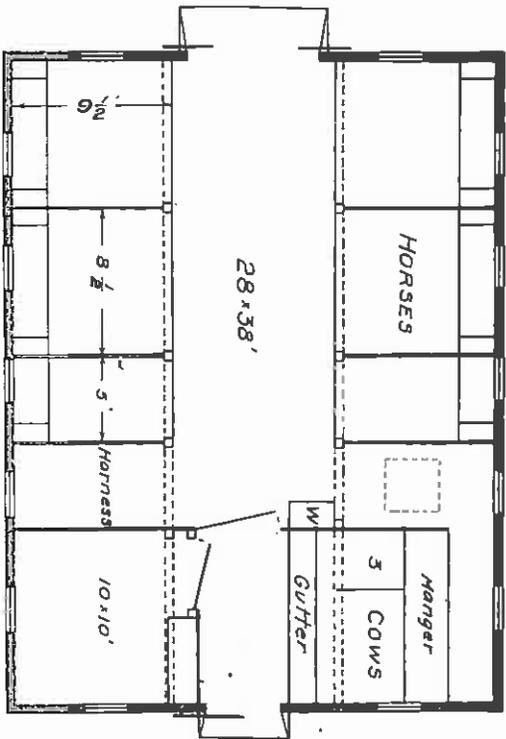


Fig. 13

horses and three cattle. It could very easily be built to house eight, ten or twelve horses as might be desired, by simply extending the length of the barn as in figure 13. This makes it chiefly a horse barn, but one capable of housing several cattle separate from the horses. The section of the bulletin on Framing shows a sectional view (figure 14) of this width barn having a Gambrel roof, which gives a large loft capacity. The posts are so arranged in figure 12 that two 2x8s ten feet long and one 2x8 nine feet long will span the width thus making the most economical length joists for this particular width barn. The loft joists for the plan shown by figure 10 will be one 2x8 fourteen feet long; one 2x8 eight feet long and one 2x8 eleven feet long which last will require a 12 foot length timber.

The barn shown in figure 15 is the reverse of figure 11. In figure 11 the barn is largely a dairy barn, with space for horses

across one end; while in figure 15 the barn is chiefly a horse barn, with a separate space for cattle across one end. The posts in figures 12, 13, and 15 can be so spaced that these barns will take two 2x8s ten feet long and one 2x8 nine feet long for loft joists.

If feed passages are desired in front of the horses, these last three mentioned barns would have to be made 36 feet wide. Such a barn would cost at least one-third more than a 28 foot barn. Unless loft space is especially desirable, it is doubtful if it is worth while to tie up that additional amount of money in a 36 foot barn merely for the purpose of securing more convenient feeding facilities. Hay chutes can run from the loft to each manger.

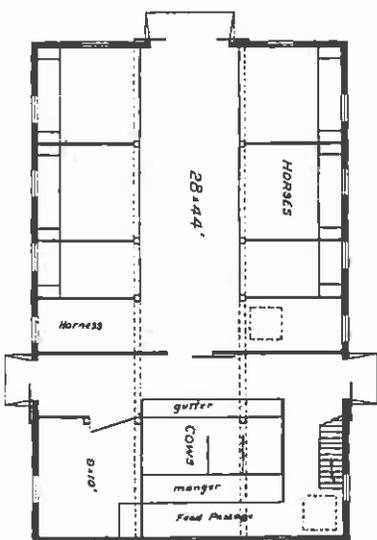


FIG. 15

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS DAIRY BARNs

The American Society of Agricultural Engineers recently made an exhaustive study of several thousand dairy barns, chiefly in the middle west. The numerous ideas secured were, as far as possible, reduced to two plans which are elastic both as to length and width. If a general purpose barn is desired, a horse stall section may be added to one end of either structure. These barns merit careful study.

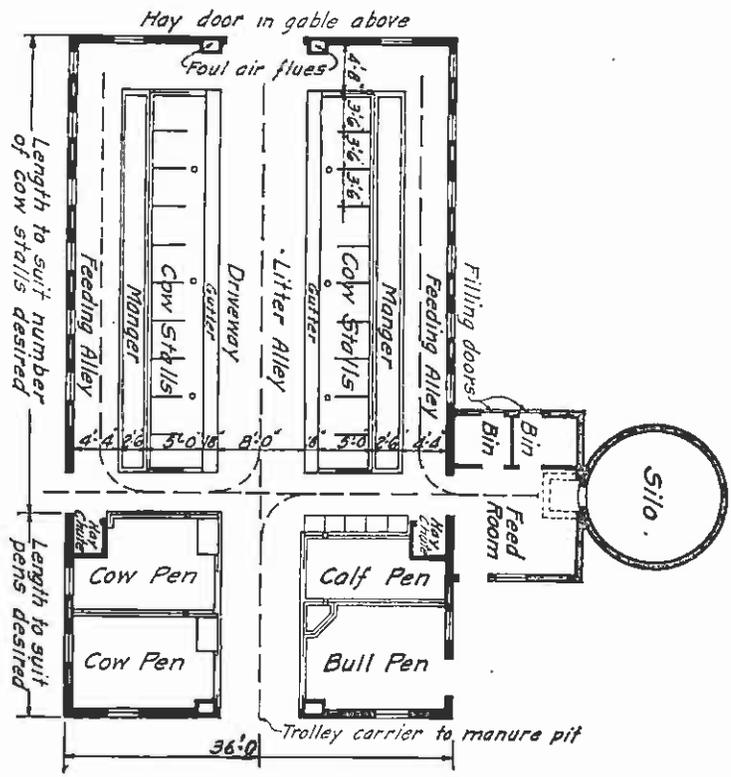


Fig. 15
A. S. A. E. Barn. Animals Heading Out.

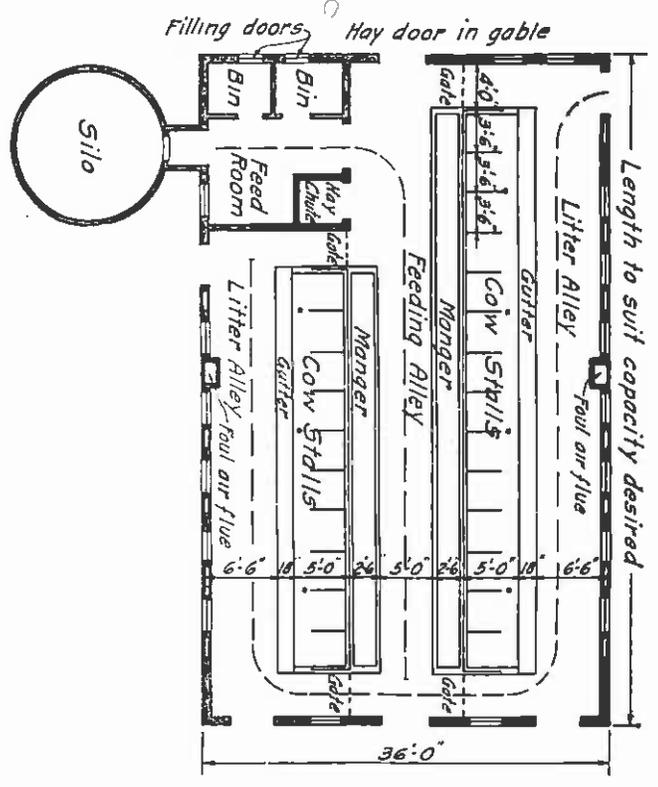


Fig. 17
A. S. A. E. Barn. Animals Heading In.

A BEEF BARN

A bulletin on barns would not be complete without some consideration of the housing of beef cattle. The requirements for beef cattle are ample box stall and manger space. The accompanying illustration (Figure 18) shows a very convenient feeding arrangement for silage and hay, and a plan where it is possible to divide the cattle into groups if so desired. By use of temporary partitions "A" and "B" a maternity stall and calf pen may quickly be secured. This type barn is also being used to a larger extent for dairy cattle, with a small milking shed in connection.

MANURE STORAGE

One of the objects of mixed or diversified farming being to keep up the fertility of the soil, it follows that the manure must be carefully utilized to that end. In order to get the full value from the manure in districts where the annual rainfall is heavy, it is necessary to provide some means for storing it until such times as it can best be put on the land. Figures 19 and 20 show plans for a small manure shed for about 15 cattle. It is simple in construction being open on all sides, and can readily be built by any farmer of average mechanical ability. The $2\frac{1}{2}$ inch gas pipe are 7 feet long

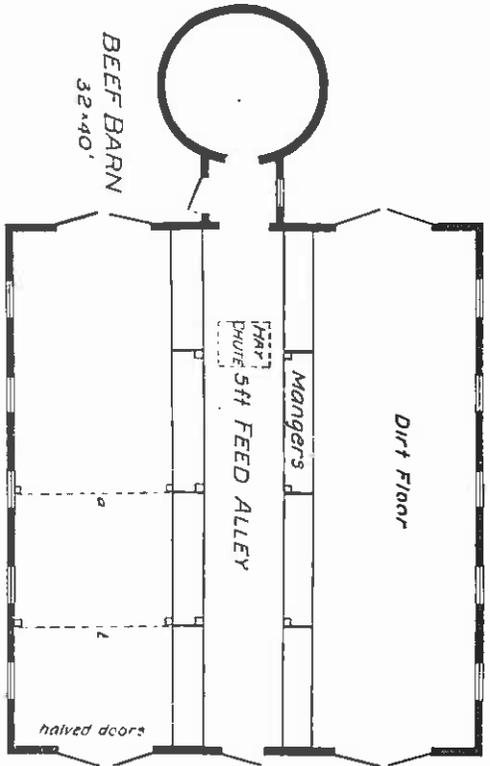


Fig. 18

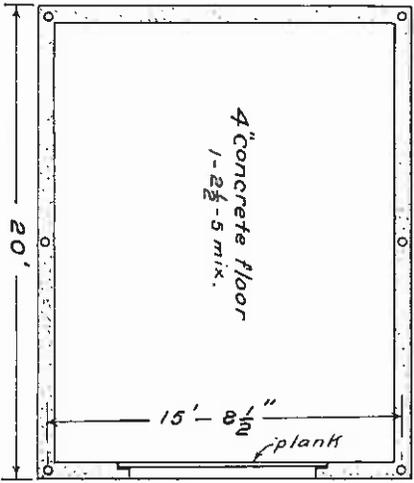


Fig. 19

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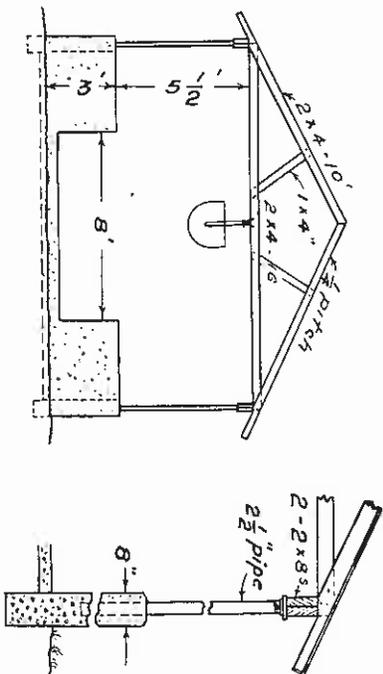


Fig. 20

and generally can be picked up at a junk yard. Pipe flanges are screwed into the upper end of the pipe, as shown, and held securely to the plate by means of two coach screws to each flange. The manure can be pitched into the spreader from any side, or, if the shed is nearly empty, the spreader may be backed into the shed thru the 8 foot opening.

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FRAMING DETAILS

The following details will be of assistance to those building barns from the plans already shown in the bulletin. The dimensions need not necessarily be followed in every detail, but the cuts should be of considerable assistance both in framing and in working up bills of materials.

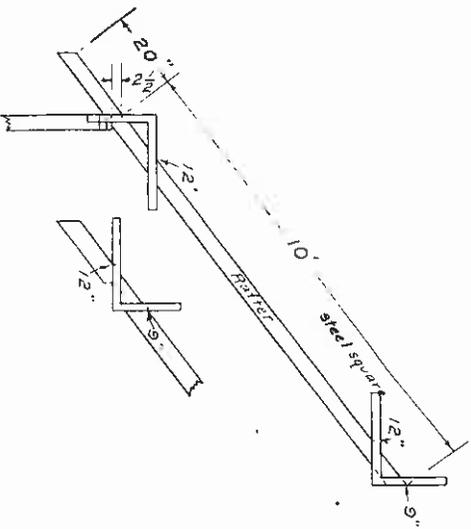


FIG. 21
Showing how to use the steel square for laying out rafters for 16 foot barns.

HORSE STALL

Figure 22 shows the construction of a horse stall. The stall has a plank floor which is generally believed to be better for the horses to stand on than cement. Where the horses are sharp shod they dig holes in the floor and it is easier to repair the floor by putting in new plank than to repair the cement. When the floor is cemented over, two 2x4s are bedded in the cement to spike the plank to. At the end of the plank there is a one inch dip in the cement

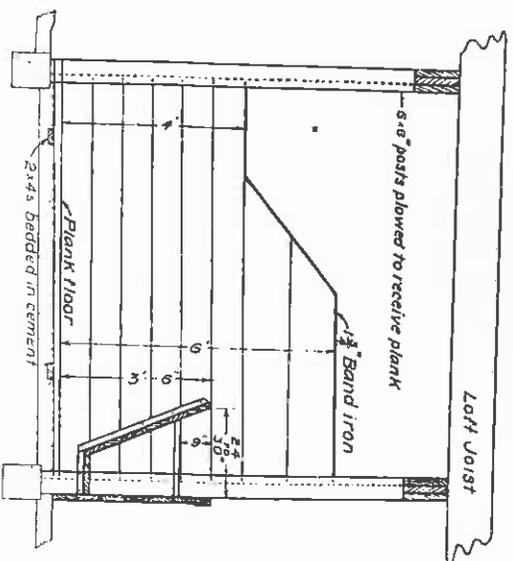
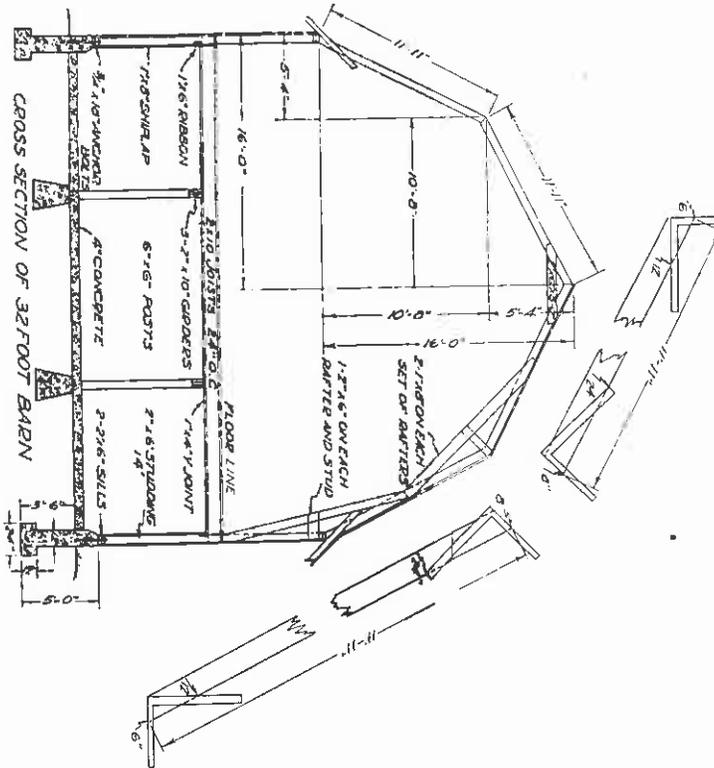


FIG. 22

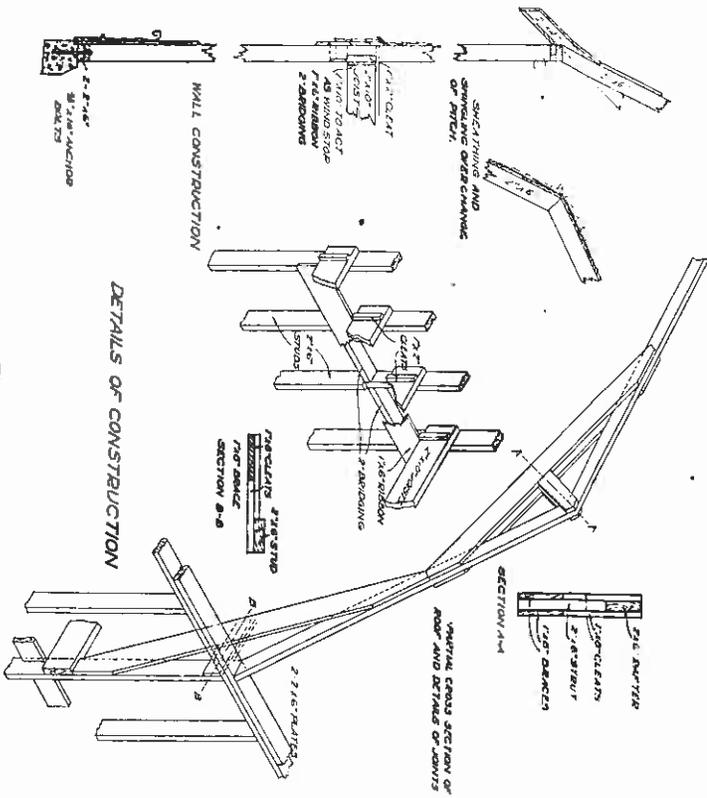
floor; this allows for drainage from beneath the plank. The floor slopes toward the gutter about one inch in five feet. The stall posts are 6x6 plowed to receive the partition plank, and set nine feet between centers; this allows nine foot plank partitions. The top of the partition is covered with 1 1/2 inch band iron; this supports the top plank, and also prevents the horses from eating the plank. The manger is built of 2 inch plank, 3 1/4 feet high, 2 feet wide at top and 1 1/2 inches at bottom. The back is 1 inch rough boards with a 2x4 on top, if the stalls are 5 foot single stalls; or if 8 foot stalls, a 2x6 is needed on the top at the back. The feed box is 10 inches wide and 9 or 10 inches high and full width of manger. The top of feed box and manger should be covered with light band iron to keep the horses from eating the wood. Some prefer a crack in the bottom of the manger to allow the dirt to drop out into the passage. This keeps the manger nice and clean, but any grain that is threshed from the sheaves or spilled from the feed box is lost, unless it is cleaned regularly and fed to the chickens.



CROSS SECTION OF 32 FOOT BARN

Note that the modern barn is well bolted to its concrete foundation.

FIG. 23



DETAILS OF CONSTRUCTION

FIG. 24

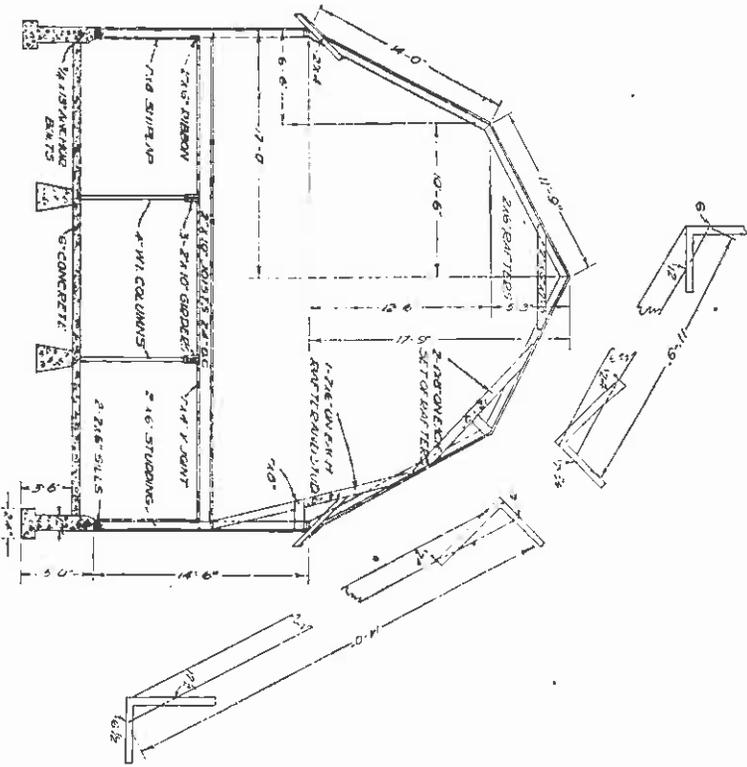


Fig. 26
Details for Barn 34 feet in width.

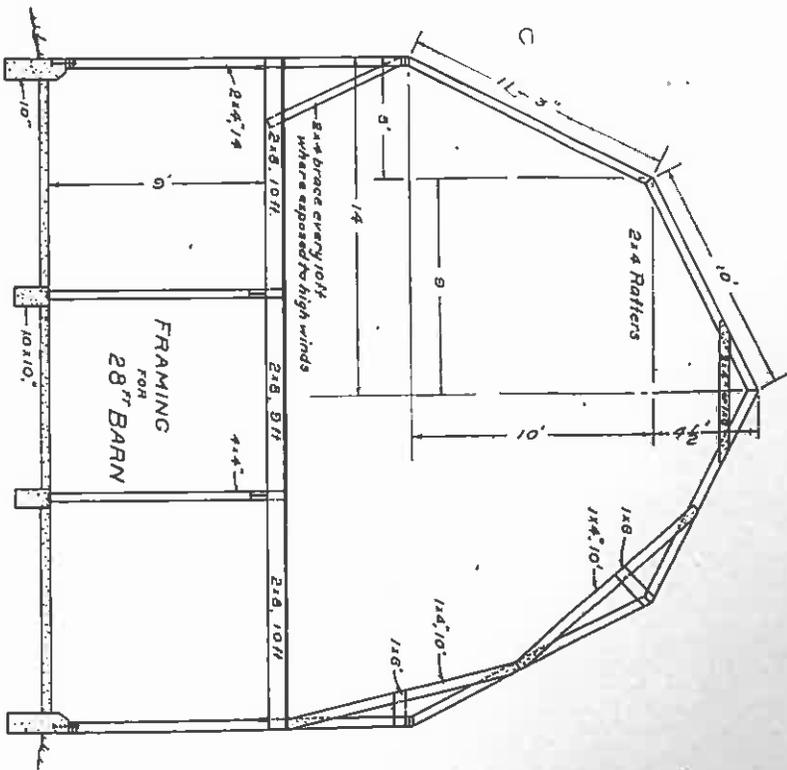


Fig. 11
The above framing for the 28 foot barn has a pair of 1x4 ten foot braces on each side and for every set of rafters. If the braces are free from large knots and are well nailed, the framing is amply strong.

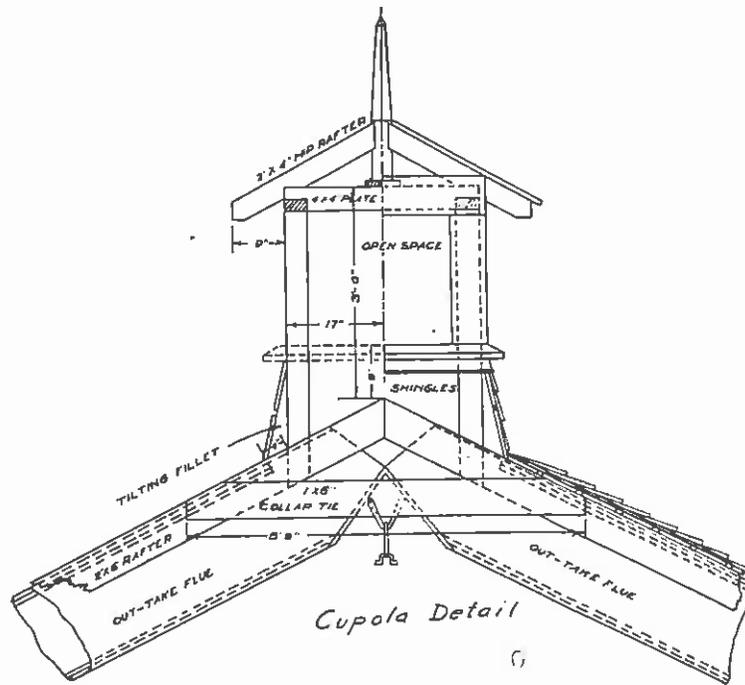


Fig. 26

Standard wooden cupola for barns, 32 feet in width. If used on 34 foot barn it should be 36 inches across; if on 36 foot barns it should be 38 inches in width.