

correct fall so as to be sure of a dry foundation—see illustration No. 3. At the low end of the stable arrange connection from the drains to points where the ends of the gutters and mangers will be. The tile which connect with the gutter traps must be laid 12 inches below the level of the gutter floor—as in illustration No. 4. All passage floors, walks, gutters and mangers must be laid with a gradual slope to this end of the stable.

Next by means of the floor plan, locate the positions of the gutters, curbs and mangers and commence the construction of the forms as shown in illustration No. 5. Note carefully all dimensions on it.

GUTTER FORMS.

The model width for a gutter is 18 inches. This will help greatly to keep both stand and walk clean. 16 inches will do, but 18 inches is better. Stretch lines 18 inches apart for the sides of the first gutter. Drive stakes made of 2 inch by 4 inch scantling, one inch inside the lines and six feet apart. To the outer sides of the row of stakes next to the cattle walk nail boards 6 inches wide and to the outer sides of the row of stakes next the cattle stand, nail boards 9 inches wide. One side will then be just 3 inches higher than the other. Between the stakes fit in short pieces of board to keep the form boards from being sprung when laying the concrete for cattle walk and cattle stand.

CURB FORMS.

After all the gutter forms have been built, stretch your lines for the curb and drive a row of stakes 2 inches away from the outer side of each line, as illustrated. These stakes must extend sufficiently above the stakes in the gutter forms so that the top of the curb forms will be 9 inches above the highest side of the gutter form. To the inner sides of these stakes nail 2-inch plank so that the space between them will be just 6 inches in width and the tops will be 9 inches above the high side of the gutter form, as shown in illustration No. 5.

FEED PASSAGE FORM.

On completion of the curb forms, lay a line to mark the edge of the manger, adjacent to the feed passage. Drive in stakes 1 inch inside of the line and to the outer sides of these stakes nail 1-inch boards, the top of which will be exactly two inches below the top of the curb form, as shown in illustration No. 5. Brace this form with short pieces cut to fit between it and the curb form.

Across the ends of the feed passage, curb and gutter forms, build forms with a straight slope from the feed passage form down to the cattle walk side of the gutter forms. Secure these forms by nailing them to stakes driven in on the cattle stand side of the forms as shown in illustration No. 5. These forms will give the correct level and grade for the sloping end passages.

In building forms, use nails sparingly and as short as possible so that they can be removed without injuring either the concrete work or the lumber. Curb forms can be set up without nails by the use of pieces of board cut the width of the curb so as to fit snugly between the form sides to hold them out against the stakes. Yokes cut from inch lumber pressed down over the form sides will keep them from spreading or bulging between the stakes and stones placed underneath will keep the form sides up to position. See illustration No. 5. The short pieces inside are removed as the concrete work approaches them but the yokes are left in place until the concrete is set.

After all the forms are complete in the stable, go over all the measurements, checking them carefully with those on the plan and insist that every one is exactly correct and that the forms are all straight and true with the correct percentage of fall.

Then you are ready for the stable equipment, the stalls and posts etc.

ASSEMBLING AND INSTALLING GALVANIZED STEEL EQUIPMENT.

The galvanized steel equipment can be put together ten times more quickly than it is possible to make wood stalls. When you give the order for the equipment it is customary for the agent or representative to take the exact measurements of your stable so that a plan can be made. If you have already decided upon a plan for building or remodeling, this or a copy of it, is sent in and the equipment is manufactured and made to order for you strictly in accordance with this plan. Thus when you commence work on your stable you find it easy to get everything in its right place.

On the best makes of steel stalls, the bolts for attaching the different parts are all in place before the equipment is shipped. There are just three big bolts to tighten up to make up a complete stall of the most improved type. All pens are made in sections and can be put together in a few moments by tightening up the few big bolts.

Complete instructions for setting up the steel stalls are furnished with the most improved styles and are not set out into details here. The galvanized steel stalls save a lot of worry and ex-

pense, in remodeling or building the stable and the help given by the manufacturers makes it possible to have an ideal job.

MATERIALS FOR CEMENT FLOORS.

The materials in each case should be of the best grade obtainable in order to insure a hard, durable floor.

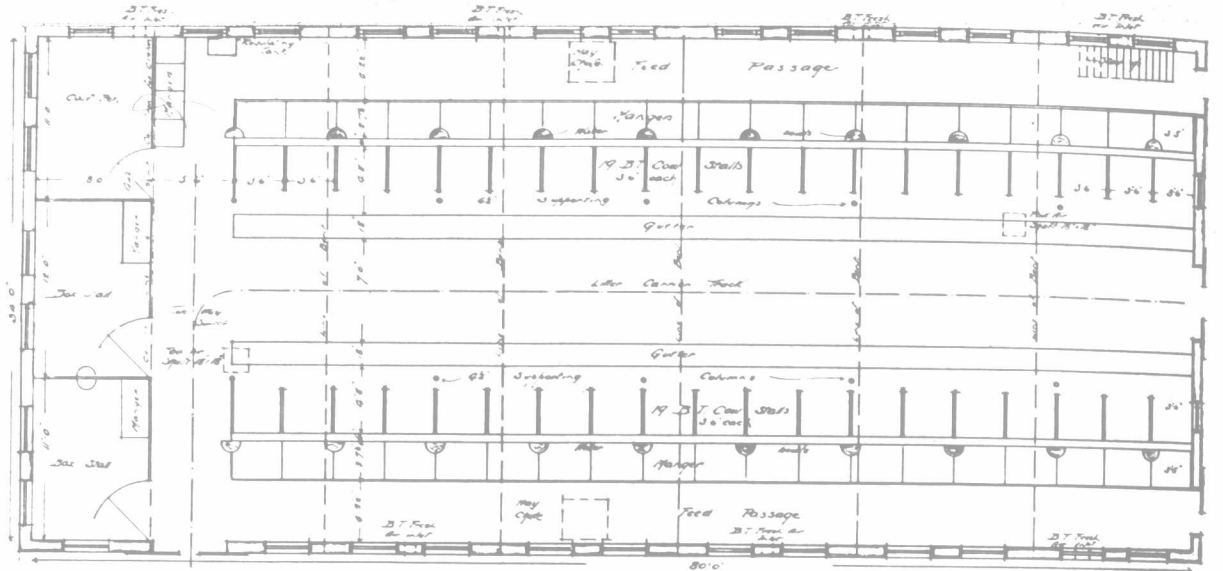
First-class Portland cement; coarse, clean gravel, free from loam and clay, which prevents the cement from binding the sand and gravel; sharp, coarse, clean sand, water that is fresh and clean and free from alkalis or acids.

Approximately 12 gallons of water will be required for the batch.

As the cement goes to fill up the voids between the grains of sand, the batch, when mixed, poured and tamped, will measure only about 10 cubic feet.

In order to make sure of these proportions, you will require a measuring box with handles, but no bottom. Its inside dimensions should be 2 feet 3½ inches wide by 4 feet long by 11½ inches deep.

Separate the pit gravel into sand and coarse



A Good Stable Plan.

Have a plan like this to go by when you commence work on your stable. See how carefully every measurement is marked, so that the job will be done just the way you want it, and everything will be right.

PROPORTIONS.

For the body of the floor, thoroughly mix cement, sand and gravel in the proportions of 1, 2½ and 5. Only sufficient water should be added to this mixture to form a stiff paste which will show water when tamped. For the 1 inch in depth of top coat or facing, make a mixture of 1 part cement and 2 parts sharp, coarse, clean sand.

For the body of the curb, thoroughly mix 1 part of cement to 4 parts sand and gravel, not too coarse. For the 1 inch top coat for the curb, mix cement and screened sand 1 to 3.

gravel by throwing it against a ¼ inch mesh screen set on an angle. Set the measuring box towards one side of the mixing platform and fill with gravel. Dump the box and spread out the gravel, making it level. Set the measuring box on the gravel and half fill with sand. Dump the box again and spread it evenly on the gravel. Next, spread over the pile two bags of cement and mix the gravel, sand and cement carefully, dry. Next spread the mixture out and make a hollow space for the water and then mix the whole batch thoroughly by shovelling it over from one end of the mixing board to the other three times. Too much

care can not be taken in making a good job of the cement work. If properly done, you will have a permanent, indestructible floor. Be careful to buy good Portland cement to start with and see that the grout is mixed thoroughly.



Showing two rows of cow stalls and relative positions of galvanized steel stalls, columns, mangers, water bowls, passages and gutters.

MIXING.

The cement, sand and gravel are measured in correct ratio on to the mixing board and thoroughly mixed before any water is added. The correct amount of water is then sprinkled on this mixture and a second thorough mixing follows. Do not use the hose, whether the concrete is to be mixed in a mixer or on a mixing board. Measure out the water with pails and when the proper consistency has been found, use the same proportion of water with each batch.

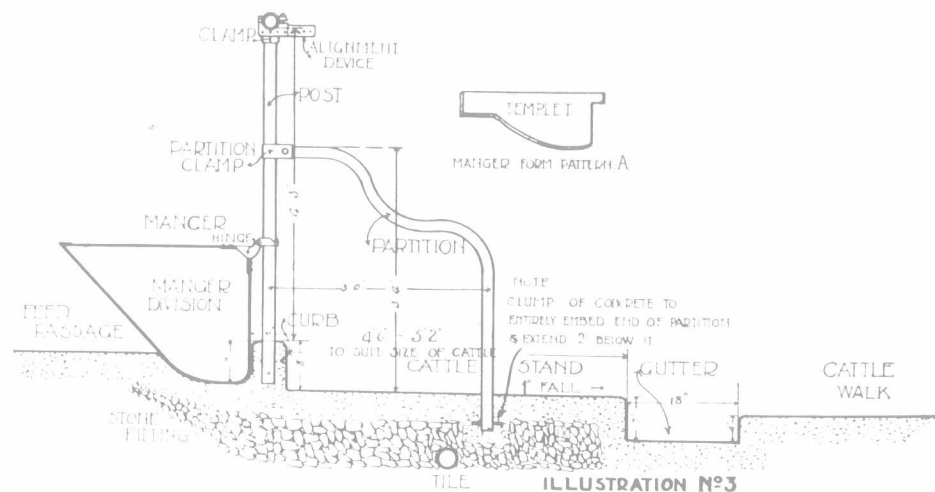
Another point to remember is to have a good foundation; not only a solid foundation but as well, a foundation that will allow the water to get away. If you cannot make a fill of stones or loose gravel, be sure to put in a row of tile under the cattle stand as shown in illustration No. 3. The floor shown in this drawing is perfect. If a cement floor is dry, you do not need to fear any under trouble. The largest dairymen in the country use it exclusively and they never have trouble with a single cow, but they see that the stable is properly underdrained. I believe that no other type of flooring will give as long and satisfactory service as a properly laid cement floor.

CEMENT CURBS.

As the curb must be strong and close grained, mix for your grout, 1 part of cement to 4 parts of clean sand and gravel, not too coarse. Work the concrete down into the form well by spading along the sides with a trowel or a flat, thin bar of steel, or even with the thin edge of a shingle. This is important in order to get the surfaces against the form boards smooth and free from air bubbles and hollow spaces. The last inch of the curb forms should be filled with concrete composed of cement and screened sand, mixed one to three. Trowel the top of the curb smooth and be sure to round off all edges so as to have no sharp corners.

FEED PASSAGES.

Raise the grade of the feed-passage areas with



Best measurements, showing best sizes, rounded corners and stone filling.

The proportions of the several materials entering into concrete are always made on the basis of bulk or cubic measure, not weight.

Take, for instance, a two-bag batch, with proportions of 1, 2½ and 5 for the body of the floor, as the great bulk of the concrete will be this mixture. Two bags cement measure 1½ feet.

The proportion calls for 2½ times as much sand as cement, or 4½ cubic feet of sand for this batch. It also calls for 5 times as much gravel as cement or 8½ cubic feet of gravel for the batch.