CONSTRUCTING WATER CISTERNS FOR HOUSES IN CITIES.

The London *Ironmonger* states that wooden cisterns lined with lead, which were formerly very common in the houses of the British metropolis, are being fast superseded by cisterns made with slate and cement, and others made of wrought, cast and galvanized iron. It also states that slate and galvanized-iron cisterns are very cleanly and durable, and the latter has the advantage as compared with capacity, over the others. The following are interesting extracts from our cotemporary on the manner of connnecting the pipes and constructing cisterns in London :—

A cistern to contain water for the general uses of a household is usually fixed in the roof, or some convenient place near the top of the house, and the water is supplied to it either from water mains or lift pumps. In the former case, of course, the first thing to be done is to make the connection with the main pipe (or rather that is the last thing to be actually done, but the first to be prepared for).

Some of the water companies, who have a high rate of pressure, lay down regulations to be observed by the plumbers as to the size and weight of pipe to be used, and will not connect unless these conditions are complied with; but as these can be obtained when required, it is not necessary to give them here. The pipes are in most cases connected with the iron mains by means of what is termed a driving ferrule, which is a cast tube of brass, bent to a slight angle, with a projection left at the elbow for the purpose of driving; one end of the ferrule being tinned is soldered to the lead pipe, and a piece of leather wrapped round the other, it is driven into a hole drilled of the required size into the side or top of the main. In some districts the connection is made by what is called a Cobourg, which is a short piece of stout cast-lead pipe, with a flat flange left at one end for the purpose of being secured to the main by means of screw bolts; in other cases screw ferrules are used. The lead pipe is then carried by the readiest and most convenient road to the cistern. Some judgment and care is required in determining the course and direction of pipes through a house; they are liable to be frozen, and consequently to burst, if carried outside, and are very disfiguring to rooms, stair cases, &c., if carried inside without being concealed. The best plan is to have casings of wood prepared in the walls, with the fronts made to fit into rebates, and secured with a few small screws; the pipes can then be, at all times, readily got at in case of alterations or repairs being required; and this leads us to mention that in all cases of laying on water, to a dwelling house especially, the service pipe should be furnished with a stopcock, just at the point where the pipe first enters the premises; thus, in the case of the pipe bursting, or ballcock getting out of order, the water can, by simply turning the stopcock, be kept from flowing over the premises, as is often the case, to the great destruction of ceilings, walls, paper, furniture, &c., when this precaution is neglected. The end of the pipe at the cistern is fitted with a self-acting ballcock or valve, which is so adjusted as to shut off the supply without allowing the cistern to get quite full. There have been, during the last few years, a number of different cocks and valves invented and patented, all possessing various degrees of excellence, such as absence of friction, increased water way, non-liability to get out of repairs, &c. Under all circumstances cheap, and consequently inferior cocks, taps or valves of every description should be avoided, as nothing is more vexing or likely to cause dissatisfaction and annoyance than to find a cock leaking, and have to be taken out again after work is finished. Two or more cisterns may be supplied from one service pipe, by either branch pipes from the principal service or from the first cistern, always fitting a separate ballcock to each.

Separate cisterns for the supply of water closets should always be provided. Cisterns in all situations should be provided with covers of wood or some other suitable material, as, in addition to the advantage of keeping out dust, dirt, leaves, rats and mice, &c., which will sometimes obtrude themselves, the water itself is better for being kept from the effects of too much light, which encourages the spontaneous vegetation and confervoid growth which plumbers often find on the sides and bottoms of cisterns which are much exposed to light and air. The water being in the cistern, our next business is to distribute it throughout the premises wherever required, which is done by again carrying pipes in any direction from the cistern to washstands, sinks, boilers, &c., as the case may be. We have described the mode of attaching these pipes to lead cisterns by means of soldering, but the slate and iron cisterns require a different mode of connection, which is effected by means of screw ferrules of various lengths; these being soldered to the end of the pipe, the screw end is passed through a hole drilled in the bottom or side of the cistern, a lead washer is then placed over the screw on the inside, a little cement of red and white lead added, and the fly nut screwed home. Formerly cast cisterns of solid lead were used, and plumbers frequently meet with them now in large old houses, many of them curiously ornamented on the fronts with quaint devices and figures in relief, and often the date of casting and the plumber's initials included therein but these are not now in use.

THE WAY TO KEEP MILK.

From a treatise on the Consumption of Milk, by Silas S. Loomis, A. M., M. D., in the volume of the Patent Office Report devoted to Agriculture, we extract the following remarks on the Preservation of Milk :—

There are three methods of preserving milk. 1. By heat. 2. By evaporation or condensation. 3. By cold and quiet.

1. HEAT.—There are two methods of preserving milk by heat. First, by heating it in the open air. This is very commonly resorted to under the name of scalding the milk. Several years since Gay Lussac demonstrated that if milk be heated gradually to boiling point two days in succession in the winter, and three in the summer, it would keep two months without souring. Second, the milk is first bottled up tightly with wired corks and placed in kettles of cold water. The water is now gradually heated to boiling point when the kettles are removed from the fire and allowed to cool. The bottles are then taken out and packed for future use. Milk treated in this manner will keep for six months. It has been claimed that the addition of soda or hedge mustard has a good effect, but it is believed that the real preservative power is the heat. By these methods the milk loses its primitive taste, and is not suitable for many purposes, nor can they be practically employed by dairymen supplying our cities.

2. EVAPORATION OR CONDENSATION.—This process was patented a few years since, and consists in evaporating the watery portions of the milk till it solidifies. It is then put up in sealed tin cans and can be carried to all parts of the world. It keeps sweet a great length of time, and is used most extensively by people at sea. There are several large manufactories in Connecticut and New York which have been in operation for several years. The particulars of the process are not known to the public.

3. PRESERVATION BY COLD AND QUIET.—This is the process practiced by dairymen generally, who are compelled to send their milk to market by the cars. The process consists in cooling the milk to about 40° Fahrenheit, as soon as possible after milking, and in keeping it at that temperature, in perfect quiet, till it is ready to be carried to the cars.

The essential requisite is a spring of cold water. The quantity of water is not of so much consequence as its degree of coldness and its permanency. The The water should be conducted underground the shortest possible distance to a suitable place for the location of the milk house. This place, if possible, should be on the north side of a hill, well shaded, and so situated that the water from the tank will readily flow off. The house should be of such size and form as to admit of a tank two feet wide, and of sufficient length to hold all the milk cans. The depth of the tank should be about four inches less than the depth of the can. Each can should have a separate division, and the divisions so arranged that the water may pass from one to another.

The water from the spring should enter at the bottom of the first division, and from the top of the first enter the second, then from the bottom of the second enter the third, and so on, alternately entering at or near the top of one and the bottom of the next division. This secures a perfect current around each can, particularly if the top entrances are at the back side of each alternate division and the bottom entrances at the front side of the tank.

The tank should be so arranged as to be out of the way of any currents of air. The ventilation of the house should be only sufficient to keep the air pure. Most milk houses admit altogether too much air. In all cases, all ingress of air to the house should be prevented as soon as a thunder shower is seen rising, and no admittance allowed till the milk is to be removed. In clear or in rainy weather the ventilator may be open, but never in showery weather.

Ozone, which is freely generated by electricity, acts energetically on milk, souring it in a few minutes, many times destroying the milk before the shower has passed over. Therefore, all air from the vicinity of thunder showers, which always contains ozone, should be carefully excluded from the milk house.

Having prepared a place for the reception of the milk, its treatment remains to be considered. The cows are milked in the cool of the evening, just after sunset, and the milk is strained into the cans which are to convey it to market. These cans hold about forty quarts, and when filled weigh about one hundred and twenty pounds. They are made of strong tin, and are well bound. As fast as the cans are filled they are placed in the tank, beginning at division No. 1. The cans remain uncovered, and the milk is not allowed to be stirred or even jarred.

The tank should be so constructed as to be disconnected with the building. It should rest flat on the ground, so that any jar of the building cannot disturb the milk in the cans.

In the morning the cows are milked before sunrise, and the milk placed in the cans as before. If there is a can partly full of night's milk, it must remain so; the warm morning's milk must not be mixed with the cold night's, but kept separate. In no case must a can of morning's milk stand in the tank above a night's can, for in that case the warmth of the morning's can will be distributed over the night's milk, and the process of souring initiated.

At about 3 or 4 o'clock in the afternoon the milk is to be carried to the cars. The cans are then to be filled if necessary. The milk being all cool can be mixed; in fact, there is no difference between the night's and morning's milk. No parts of cans are to be sent to market, but to be kept over twenty-four hours longer.

The cans are then placed in a wagon and a wet covering spread over them, over which are thrown buffalo robes or other covering. At the railroad station the cans are closely packed in a closed car without anything being thrown over them, and during the night reach New York. "The rate of a night milk train when in motion is twenty miles per hour."

The cans are then taken by milk carts, and the milk is distributed to consumers. The milk, therefore, does not leave the cans till it is sold, and generally it is disposed of at a temperature nearly as low as it left the milk house. In this condition it will keep sweet twenty-four or even thirty-six hours, and is a pure country milk, quite different in value from that peddled at a smoking temperature of 70 or 80°

A similar process of cooling milk has been practiced several years. It has been thought necessary to stir it several times while in the tank to aid in cooling, but it is now, however, found that this treatment is highly injurious. The milk should be kept as still as possible till cooled to about 40° Fahrenheit, or below, when it may be stirred or transported to a great distance without injury, provided the temperature is not elevated.

The above process is that practiced on the Harlem railroad during the hot months. Not so much care is necessary during cool weather. The water, however, is always kept running, and the milk houses kept patterns of neatness. The cans are cleansed with boiling water and sand after returning from the trip. The cost of transportation averages one cent per quart; the producers sell it, delivered at the station, for two cents; therefore it costs, ready for delivery in New York city, three cents per quart. Usual retail price six cents.