greatly conduce to the well-being of the ants, and enable the colony to persist long under adverse circumstances.

Rejection of Non-nutrient Substances and Avoidance of Poisons.—The ants not only exercise a judicious choice among edibles, but they carefully eliminate all innutrient particles from what they take into the mouth. Into each of four similar nests I put a queen and fifty workers, and during three months fed one group with pure molasses; one with molasses triturated with cochineal; one with molasses triturated with indigo; and one with molasses triturated with turmeric. In every nest the finely pulverized dye-stuff was separated in the mouths of the ants from the nutrient fluid, and was cast out in minute pellets forming a characteristically colored heap in a corner of the nest. In the first nest a pile of brown pellets indicated that non-nutritious particles had been rejected from the unmixed molasses. It is evident that the ants do not burden the digestive organs with innutrient matter, and that the preclusion of all such matter must greatly conserve the energy of the ants in the processes of digestion.

Ants that had fasted ten days did not partake of sweets in which poisons had been incorporated, although their mates ate the unpoisoned sweets with avidity.

When the ants were compelled to walk over viscid sweets with which virulent poisons had been commingled, the ants appeared to die soon after cleaning their feet with use of the tongue, but many of them revived some minutes or some hours later and resumed their normal activities. Even the fumes of cyanide of potassium, which caused the ants to swoon after a brief exposure to it, did not prevent their revival after they were returned to pure air.

Effects of Heat on Ants.—While the activities of ants in their ordinary occupations, the laying of eggs, the feeding of the larvæ, and the hatching of pupæ, are all accelerated by rise of temperature to about 82 deg. F. or 27 deg. C., any degree of heat above 90 deg. F. or 32 deg. C. proves injurious to them. In torrid countries it is commonly said that the ants, like the people, take a rest at midday; and the withdrawal of the ants from noontide heat is probably an act of self-preservation.

In experiments recently made by me, a continued application of heat, wet or dry, of a degree so high as 122 deg. F. or 50 deg. C. killed all the ants of the four species used. The larger the ants the longer the exposure required for their extinction, but two minutes compassed the destruction of the largest ants known in the United States. No ant recovered after two minutes in water or in air heated a little more than half way to the boiling point of water, and ant-infested earth raised by any means to this temperature will present no danger of further development of the ants therein nested.

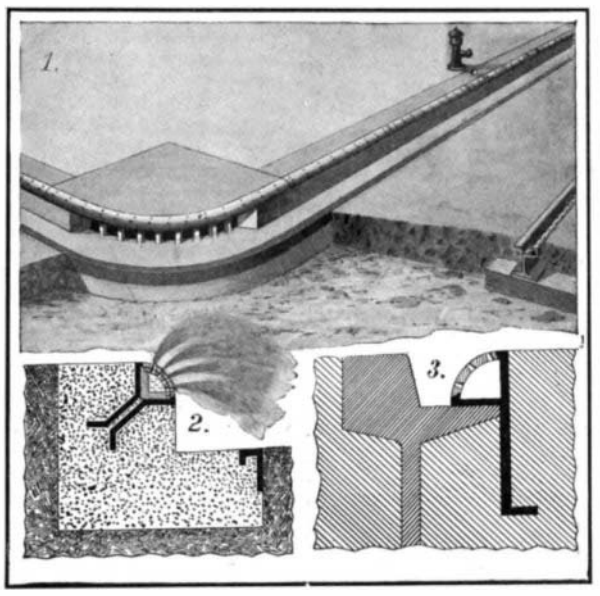
Male ants are much less tenacious of life than are the workers; and workers, usually much smaller, are less hardy than are the queens.

A Dental Invention Which Permits of Painless Work upon Teeth.

By an invention of Dr. Crittenden Van Wyck, of San Francisco, Cal., all dental work, such as drilling into a tooth to remove decay and prepare it for a filling, or to grind down a tooth for a gold cap, or to remove nerves, may now be done painlessly. This is a wonderful advance in dental science, and will take away all dread of approaching the dental chair, when such work becomes necessary. The method has been proven successful during four years' trial. The device of which this note is a brief description is called the Van Wyck obtunder. By its use a tiny spray of ether is thrown upon the tooth to be operated upon. The rapid evaporation of the ether produces coldness, and within a few moments the tooth becomes perfectly numb and all sensation is lost. The dentist can now use his drilling machine, and bore out all decay and properly prepare the cavity for a filling, the spray continuing to run during the cutting operation. The method is therefore very simple and effective. By placing a few drops of a strong perfume in the ether glass receptacle, the odor from the spray is made welcome, the ether odor being almost entirely disguised. No bad effects are noted in any manner from the use of this method. The first shock of coldness is prevented by placing a piece of cotton upon the tooth to be sprayed upon, and thus the temperature is reduced gradually and without any pain. The normal temperature returns to the tooth as soon as the spraying is discontinued, and no after effects of any kind are to be feared. The spray is formed by using twenty pounds of compressed air, and is regulated by a valve. It is directed upon the tooth by a flexible metallic tubing, bent in such a manner as to throw the spray upon any tooth desired.

A STREET-SPRINKLING CURB.

A decided novelty in curbs for sidewalks and streets is provided by the recent invention of Mr. John F. McCoy, 1433 Melpomene Street, New Orleans, La. Imbedded in the concrete curbing is a metal tube provided with perforations in its outer side. The tube is connected with a street hydrant, and when it is desired to sprinkle the street, it is merely necessary to turn the valve of the hydrant, permitting the water to pour into the tube, and out through the perforations. The street can thus be flushed and cleansed of refuse, which

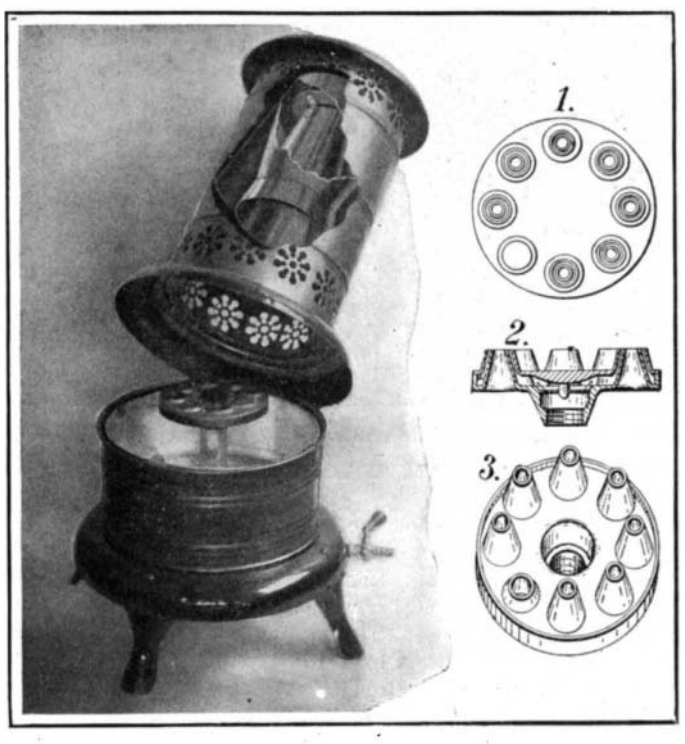


A STREET-SPRINKLING CURB.

will be washed into the gutters and drained off in the usual catch basins at the corners of the street. Obviously this is an improvement upon the costly and primitive methods now commonly followed in our cities of using sprinkling carts; for by merely operating a single hydrant a whole street or a whole section of the city may be sprinkled at once. But aside from its use for sprinkling the streets, this tube serves as a bond to protect the edge of the curb. The edge of the gutter is also protected by imbedding an angle rail in the concrete, as shown in our engraving. Mr. McCoy's patent covers a number of constructions for the sprinkling tube, one of which we show in cross section in Fig. 2. It will be observed that the tube, which is of approximately triangular shape, is made up of two heavy metal sections, one of which forms the bottom and rear walls, and the other the curved outer wall. In the latter are the perforations for sprinkling. The tube is secured in the concrete curb by means of metal straps which fit over the tube and have their lower ends imbedded in the plastic material. Perforations are provided in the straps which register with those in the tubes. These straps are used for coupling together the different lengths of tubing. The perforated wall sections are reduced or offset at the ends so that a recess is formed between the two lengths of tubing which are to be coupled. In this recess the strap snugly fits with its outer face flush with the curved wall of the tube. The sprinkler tube may be fed either from the regular fire hydrant or from the supply pipes of adjacent yards and houses. In the latter case valves are placed at intervals along the tube so that the owners may sprinkle the street in front of their own premises. Fig. 3 shows the sprinkling tube applied to a street railway rail, where it serves both as a bond for the edge of the pavement and as an additional means for sprinkling the street. This curb construction may also be used as a border for yards, garden walks, and the like.

AN ODORLESS GAS STOVE.

The principal objections advanced against gas stoves of the usual type are that they give a very dry heat, and that they almost invariably yield a disagreeable odor. In addition to this the amount of gas consumed is quite large, so that they do not afford very economical heat. In the accompanying illustration we show a new type of gas stove, in which these objectionable features are overcome. It is claimed for this stove that the cost of running it does not exceed that of the ordinary oil stove, that it keeps the air of the room moist, and that it is absolutely odorless. An important feature of the stove is a novel burner which insures a perfect distribution of the mixed gas and air to the burner tips, and which is arranged to be easily taken apart for cleaning purposes. The burner consists of two plates, the lower one of which is coupled to a gas supply pipe projecting through a galvanized-iron pan in the base of the stove. This pan is filled with water which, as will be shown presently, serves to keep the air in the room moist. At the bottom of the supply pipe is the valve which controls the amount of air mixed with the gas. The lower plate of the burner, as shown in Fig. 3, is formed with an annular flanged rim which serves to space the two plates apart and with a series of conical tubes which are adapted to project through openings in the upper plate. These openings are larger than the tubes, and thus form annular passages through which the gas mixture flows to the blue flame jets. A plan view of the burner is shown in Fig. 1, from which it will be observed that since the conical tubes open through the bottom plate, a center supply of air is fed to each jet on the principle of an Argand lamp burner. It will be noted in Fig. 2, which is a section through the burner, that the flanged rim of the lower plate is very low and, consequently, the chamber formed between the two plates is very shallow, much shallower than the usual gas chamber, and in reality serves merely as a passage for the gas mixture. To insure a more perfect distribution of the mixture to the jets, a boss is formed on the under side of the upper plate in which there are a number of spiral grooves leading to the different burner tips. One of the conical tubes is shorter than the others, and over it in the upper plate is a closed thimble. The gas flows through a passage between the top of this pipe and the thimble and is then directed downward in a jet which plays upon the water in the pan. This insures a rapid evaporation of the water, which intensifies and moistens the heat and removes all odors from the gas stoves. If desired, antiseptics and disinfectants may be added to the water to purify the air of the room. In our engraving the upper portion of the stove casing is broken away to show an interior cone-shaped drum so arranged as to produce a strong draft. A plate at the top of this drum deflects the heated air, causing it to flow against an outer cone, thence it passes through an opening in the top of the latter cone and out through the perforations in the stove casing. The outer and inner cones are connected by a third cone, forming a reservoir for heated air which keeps the outer cone hot, thus heating, as well, the air which pours up between the outer cone and the stove casing. In use the deflector at the top of the interior cone becomes red-hot and insures perfect combustion of any partly burned matter which may be carried up by the strong draft. The patents on this novel stove are owned by the Odorless Gas Heater Company, 86 and 88 Worth Street, New York, N. Y.



AN ODORLESS GAS STOVE.

A Long-Distance Heating Plant.

A long-distance steam heating plant, where the source of heat and the place of consumption are 2½ kilometers distant, has been completed in the Eglfing Sanatorium, in Upper Bavaria. The steam conduits are arranged in a concrete tunnel, the walls of which are lined with an asphalt coating, which in connection with a cork slab vault minimizes the loss of heat by radiation. The pit is sufficiently wide to allow a man to stand and walk within it. It is lighted at intervals from above by daylight, and by small electric lights during the night. A novel substance, consisting of charred silk threads, has been used to surround the conduits and protect them against heat losses. The steam entering the conduit at 159 deg. C. was found to have a temperature of 152 deg. after covering the 2½ kilometers distance. The buildings themselves are heated by hot water, the steam serving only to heat the water boilers by means of coils. The plant is provided largely with electrical long-distance signaling apparatus, so as to allow of its being controlled and adjusted from the boiler house. Thirty pavilions and six administration buildings have been connected to this extensive plant, the cost of installation of which, including the tunnel, was about 250,000 marks.