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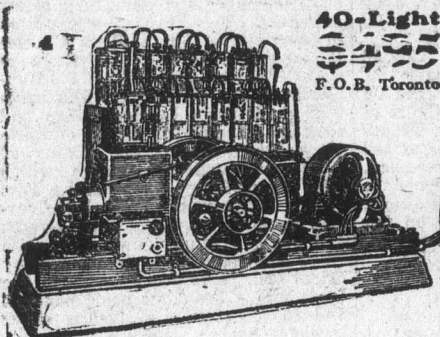
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J. MCKERCHER



FOR WINTERING BEES

Some Insulating Materials and Their Appreciation.

Cork Dust and Dried Forest Leaves Are Better Insulators Than Wood Shavings or Sawdust—Even Temperature in the Hive Important.

(Contributed by Ontario Department of Agriculture, Toronto.)

THE results of the relative non-conductivity of some bee-hive insulating materials are given below as the result of tests, 100 being the standard:

Very fine black regranulated cork (dust form), 100.

Chopped straw, 86.

Coarse black regranulated cork, 85.

Forest leaves (well dried), 84.

Granulated cork, light or natural color. This is the grade usually used as packing about imported Malaga grapes for instance, 84.

8-20 grade granulated cork (natural color). It looks similar to preceding one but it is a little coarser in grain and lighter in weight, 80.

Sawdust, very dry and from well seasoned and clean lumber, 68.

Excelsior—grade used in packing boxes, 60.

Planer shavings, 60.

The lesson of this table is that the fine black cork dust is the poorest conductor of heat or the best insulator so far as the resistance of the passage of heat is concerned, and planer shavings is the best conductor of heat, and therefore the poorest insulator of the nine substances tested. The fact should be emphasized that these results do not tell us anything about the substances except their power to conduct heat. It may be that if they were tried out as insulation for bee-hives we would arrange them differently than as given above. There are other properties besides conductivity of heat that figure in practice, and a consideration of these is my second purpose as announced at the beginning.

A good insulating material necessarily is a poor conductor of heat, but all non-conductors are not necessarily good insulators in practice, or, at any rate, not always desirable or satisfactory. Next to non-conductivity is low moisture absorption or the ability

to keep comparatively dry in weather conditions. Experts in bee-keeping say that high moisture content in the hive is fatal to the bees since it causes dysentery among them. Let us assume that the air in a hive is very moist, say at a normal temperature, and the temperature goes down several degrees owing to inadequate protection or insulation about them, and see what happens. The result is exactly the same condition we all have often observed on the outside of a water jug filled with cold water and set in warm air. Moisture congeals on the outside of the jug, and it becomes cold and clammy and the water drips from it and makes everything else it touches wet. Likewise the dew is formed. The physical reason for these phenomena is the fact that cold air cannot hold in the invisible or vapor form as much moisture as warm air can.

Some of the moisture held at high temperature must appear as drops of water at the lower temperature, or in other words there is a rain, and a rain in a bee-hive is a serious matter, but it can be prevented by controlling the temperature inside the hive. Herein exists one of the most important uses of the insulation about the hive. Other reasons why an insulation should not absorb moisture are that moisture increases the conductivity of the insulation for heat and also makes it more liable to deterioration and decay. A good old maxim regarding success says, "Keep your powder dry." With equal emphasis it may be said: "Keep your insulation dry if you would protect your bees well and give them a fair chance to succeed."

Of the substances listed in the foregoing list granulated cork, forest leaves (if dried for one year ahead) and planer shavings are the poorest absorbers of moisture. Sawdust usually is too green and dirty to be very dry at the very best, and decays sets in rapidly, and chopped straw unless very well ripened and cured may be objectionable in the same way as sawdust. Then, too, rats and mice are apt to bother it seriously. The insulation must be odorless, else the bees may leave the hives. It must be readily available and reasonably cheap, and in these particulars forest leaves, chopped straw and planer shavings are foremost. It also should be easy and agreeable to handle and pack in position, and not subject to spontaneous combustion.

Thirdly, the main reason for insulating the hives, especially in the winter season under outside conditions, is to conserve the bees own warmth so that they can live comfortably and not have to eat an extraordinary amount of food in order to maintain a normal temperature. The bees get their warmth and energy from the food eaten, and it is the function of the hive and the extra insulation to keep this heat from being wasted in cold weather in the surrounding atmosphere. A second reason is to maintain an even temperature in the hive, and this pertains both to summer and winter, or to any season in fact. The insulation assists in preventing extremes of temperature in the hive as a large body of water does to the adjacent land areas. Another reason, and not the least because mentioned last, is that a good insulating material the hives provides a drier, and therefore a healthier and in all respects a better atmosphere for the bees than could be possible otherwise. Surely these are sufficiently good reasons why a hive should be protected by an efficient insulation. Flax chaff and a fine excelsior known as wood wool may also prove good insulations for bee-hives.—R. R. Graham, O. A. College, Guelph.

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Williams Bros. Garage

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For Sea-going Craft.

For sea-going craft a window has been invented containing a disk of glass which is revolved by an electric motor, throwing off rain or spray that falls on it and affording clear vision at all times.

Straw Braid Trimming.

A very odd trimming is seen on some of the new satin models. It is a bristly straw braid sewn to the frock in a conventional design very much after the manner of old-fashioned braiding. The effect is extremely novel. By combining embroidery done in heavy black silk threads with this straw braid great elaboration is obtained.

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