

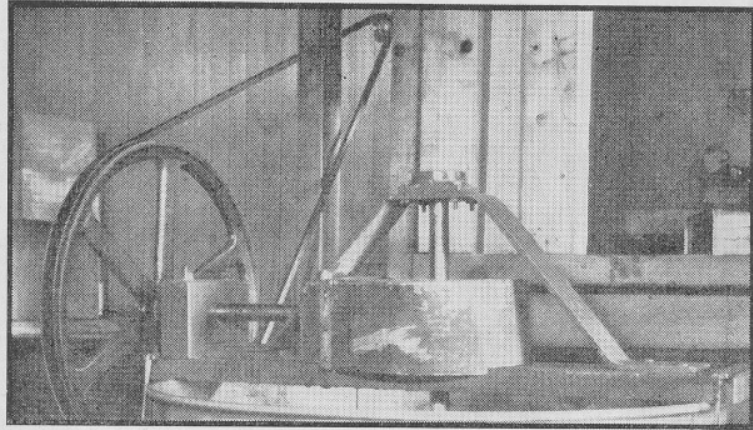
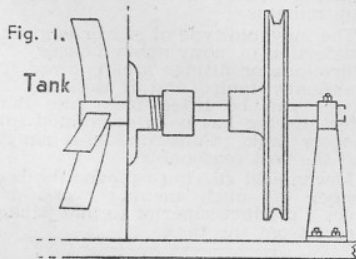
Use of Stirrer Ensures Smooth Grain in Honey

TO maintain the popularity of honey with consumers beekeepers should be careful to see that nothing but smooth-grained honey is placed on the market. The demand for liquid honey is very small compared with that for well-packed, fine-grained honey. To encourage beekeepers to place their honey on the market in its most attractive condition the construction of a simple type of honey stirrer is described in this article by C. R. Paterson, Apiary Instructor, Department of Agriculture, Hamilton.

HONEY varies greatly according to the nectar from which it is derived, and very few honeys will remain in a liquid condition for any length of time. The floral source of honey not only has a definite bearing on the time taken to granulate, but also on the smoothness of the grain. It can generally be accepted that honeys which granulate very quickly will have a comparatively smooth grain, and those which take a considerable time will have a coarse grain. Honeys from pohutukawa and rata come into the first group; most other honeys take longer to granulate, and if left untouched, may granulate with coarse crystals. For many years it has been known that beekeepers can remedy this drawback of coarse-grained honey if they are prepared to undertake the adding of a small amount of starter honey, stirring, and temperature control. Before the construction of a honey stirrer is described a summary of points governing granulation will be of interest.

Extracted honey may have a considerable number of coarse-grained crystals in it. These can be the result of not drying out extracting combs the previous autumn, or extracting a few combs of the past season's honey that has partially granulated. Honey in this condition will not respond to the addition of starter honey, as the coarser crystals predominate. The only way to rectify this is to heat the honey to approximately 130 degrees F. until all crystals are destroyed.

The temperature of the honey should be about 75 degrees F. before the starter honey is added. Temperatures above this level are liable to melt the very fine crystals in the starter honey.



Movable stirrer set up in honey house.

The starter honey has to be thoroughly mixed into the liquid honey. This is done by stirring without incorporating any air bubbles.

The proportion of starter honey added is generally from 5 to 10 per cent. of the bulk. More starter will hasten granulation, provided temperatures are right.

Once starter has been thoroughly incorporated throughout the honey, packing can begin.

After packing, honey should be subjected to a temperature of approximately 57 degrees for about 4 days. (This applies more to summer packing when air temperatures are well above 57 degrees, and cooling rooms are necessary only for these periods.)

Toward late autumn and winter, when evenings are cooler, stirring can be carried on a little longer, and after packing, the honey will be found to set firm in a few days.

Methods of Stirring

Depending on the circumstances, the following types of stirrers may be used:—

Wooden Stick or Paddle

For small quantities of honey a wooden stick or paddle stirrer will be found adequate. When tanks of 1-ton capacity each have to be dealt with a considerable amount of energy is required to get the starter thoroughly mixed. Even with the most careful work there is a tendency for streaks to form in the packed honey. This is due to small portions of the liquid honey not receiving the quota of starter.

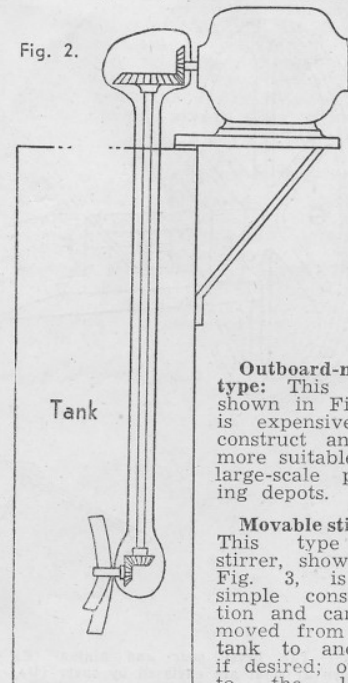
Nelson Stirrer

The Nelson stirrer is constructed on the pattern of a cream stirrer. A heavy circular plate has a number of holes bored in it of about 1 in. in diameter. A rod with a handle on the other end is securely screwed or welded to the centre of the plate. By moving this up and down in the honey a fairly good mix is secured. Do not bring the plate above the surface of the honey, or too much air will be mixed into the honey.

Mechanical Stirrers

Propeller type: This mixer consists of 4 curved blades welded to a collar which fits on to a shaft set in the side of the honey tank. As this shaft has to rotate approximately 100 times a minute, a fairly powerful motor is required (at least 1 h.p.). Fig. 1 shows the set-up of this mixer. It is more suited for a quick mix, after which the honey is placed in a cool room.

Fig. 2.



Outboard-motor type: This type, shown in Fig. 2, is expensive to construct and is more suitable for large-scale packing depots.

Movable stirrer: This type of stirrer, shown in Fig. 3, is of simple construction and can be moved from one tank to another if desired; owing to the lower speed of the mixing arms, a much smaller motor ($\frac{1}{2}$ h.p. is usually suitable) will drive it.

The construction of a movable stirrer is comparatively simple and should offer no difficulties to the beekeeper who is handy with tools. No



CONSTRUCTION OF MOVABLE STIRRER . . .



Honey stirrer fitted to a mixing tank which is a milk can set on a stand having ball castors.

dimensions can be given, as the size will vary according to the tank that is to be used with the mixer.

Following is a description of the material that will be required. (The letters against each item correspond to markings on Fig. 3.)

A—Cross-member. This can be made of 6in. x 2in. well-seasoned timber, totara for preference. The length should be sufficient to allow about 2in. over the edge of the tank. A 1in. hole is bored in the centre for the shaft. If the stirrer is to be in constant use, it will be best to have a small brass plate, recessed to take a ball bearing of suitable size, bolted over this hole.

B—This bracket holds the top bearing of the mixer spindle and gives rigidity to the whole unit. It is made of flat iron 2½in. wide and ¼in. thick. When this is being bent into shape see that it sits perfectly flat on the cross-member. A 1in. hole is bored in the top for the spindle. A plate with ball bearing can also be used here as shown at B1. A hole is also bored at B2 to allow the driving shaft to go through. Drill four ¼in. holes in the bracket for bolting it on to the cross-member. Before boring the holes in the wood place the bracket in position and move the bracket into position, ensuring that the upright shaft is at right angles to the cross-member. Check to see if the shaft turns freely. Clamp the bracket in this position and then bore the holes.

C—1in. steel shafting is used for the mixer shaft. Here again its length will depend on the depth of the tank.

D—This is a cover made of any light metal to prevent any grease which may come off the gears from falling into the honey. The sides and bottom, which has a 1in. hole in the centre, are placed in position before the gears are assembled. The top rests on the side and can be lifted up sufficiently to oil or adjust the gears.

E—The bevel gear and pinion will most likely be parts secured from motor-car spare parts; the ratio of this type of gearing is generally about 3 to 1. Old model T Ford crown wheels are quite suitable and require a casting or plate for bolting on to.

F—The bearings for the driving shaft can be seen at F, F. They are made of hardwood, and here again if the stirrer is to be given much use, light ball races should be let into each wooden block. This, of course, has to be done on a lathe to secure accurate alignment. The shaft can be 1in. or ¾in. steel shafting.

G—The V pulley is approximately 20in. in diameter and is a type in common use on water pumps. With a 2in. pulley on the electric motor, a pulley of this size will turn the stirrer at about 50 revolutions per minute.

H—Three stirrer arms are required; their length should be about 2in. short of the diameter of the tank and they can be made of oregon pine or of metal. Pieces of wood approximately 2in. square should be selected and a 1in. hole bored in the centre of each. With a small saw, cut lengthwise for about 1½in. on each side of the hole. This allows the holding bolts to draw the wood hard against the spindle. To prevent the bolts from sinking into the wood small metal plates on each side should be used. The arms are now shaped to give them a propeller-like action. See that all are cut with the same pitch and placed on the shaft in positions which are staggered. It is advisable to give the arms a coat of clean, hot beeswax before assembling them. The shaft can be given a coat of aluminium paint and when thoroughly dry lightly sandpapered to remove any surplus. Instead of the wooden arms shown in the diagram metal arms can be made by using short pieces of flat iron and welding them on to metal collars at the appropriate angle. Set screws are then placed in the collars to fix the arms to the shaft. Metal arms can be tinned to complete a permanent job.

Holding rods are used for keeping the stirrer firmly in position on the tank. The motor, which needs to be about ½ h.p. can be set on the floor. A shorter belt will be required if the motor is fixed on a wall bracket, but the placing of the motor is a matter which will depend on the beekeeper's requirements.

The movable type of stirrer is giving satisfaction in many honey houses. No alterations or fittings are required for the honey tanks, and if desired, the stirrer can be lifted from one tank after stirring has been completed into another tank. Construction is simple and the cost reasonable.

Mechanical stirring relieves the beekeeper of much manual work and gives a product superior to that packed direct from the tank.

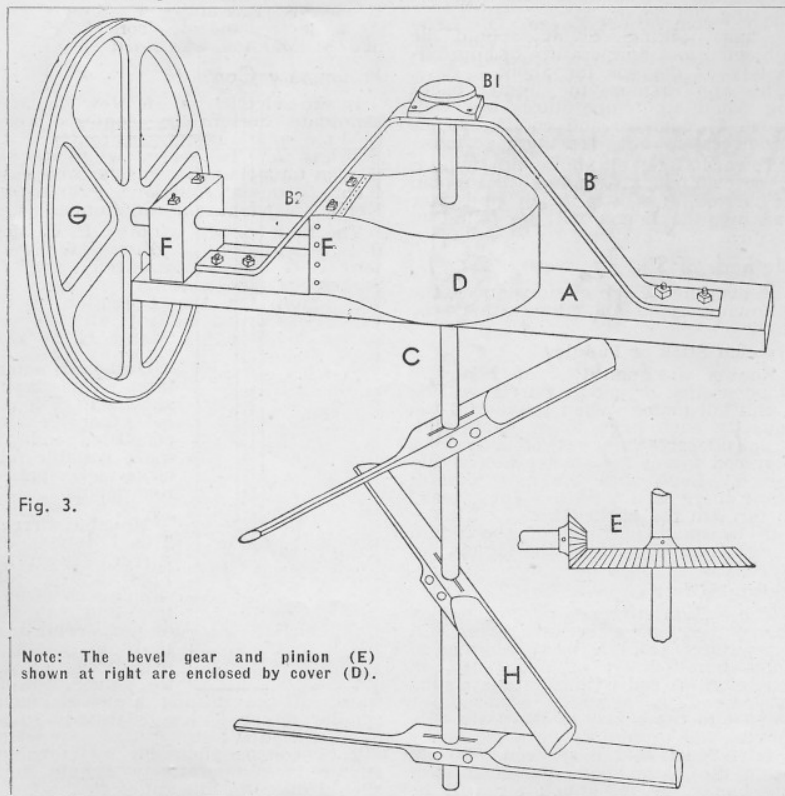


Fig. 3.

Note: The bevel gear and pinion (E) shown at right are enclosed by cover (D).