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## How Root's Bee-keepers' Supplies are Regarded by a Large Illinois Firm

A. I. Root Co.,  
Medina, Ohio.

June 12th, 1906.

Gentlemen:—I have just finished unpacking the last box of supplies, and must say they are *very satisfactory*. The frames especially are extra fine, and I am just wondering how I was so foolish as to buy the thousands I already have from that other firm.

After seeing yours, I have made up my mind that I would much rather buy yours than take theirs for a gift.

This is no jolly, but the simple truth.

Very truly yours,

James Tough,  
1613 Clarence Ave.,  
Oak Park, Ill.

## PUBLISHERS' PREFACE AND INTRODUCTION

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In putting out this little work the publishers believe that the shallow hive with closed-end frame and 4x5 plain section is not sufficiently well understood. It was with this end in view that they have endeavored to correct some popular misapprehensions, and at the same time show that some bee-keepers at least, may be losing much by clinging to their old-fashioned methods. Besides, the hive and system herein described have been sufficiently tested so that it is believed that every statement herein made will be verified by actual work with the bees.

As there may be some to whom this work will go who may not understand the first principles of bee-keeping, it has been thought best to give very briefly the life-history of the honey-bee, closing with a description of the methods of management.

If the reader is entirely unfamiliar with the subject of bee-keeping it is suggested that he reads parts II and III and then part I. Having done so he will then be able to comprehend some of the points made in favor of the shallow hive and closed-end frame of the Danzenbaker type as set forth in part I.

In this connection it may be well to state that the publishers also issue a booklet on the divisible-brood-chamber hive that permits of a system of management similar to that herein described. The price of this little work is 10 cents. Another booklet is on the subject of the Dovetailed Langstroth hive and Hoffman frame. This latter work describes the hive more commonly in use by bee-keepers generally. Should the

reader have a large number of these hives he would do well to send for this booklet, as it will enable him to understand the reasons for its construction as well as how to handle it.

It is advised that those who desire to go into the general subject of bee-keeping more extendedly procure a copy of the A B C of Bee Culture, a cyclopedia on bees, of over 500 pages. As the general subject of bee-keeping is a very large one, it is impossible in these brief booklets to do more than merely touch on some of the important phases of bee culture. If any one has any bees at all he will do well to secure not only the booklets above mentioned, but the larger work, the A B C of Bee Culture. Then if he desires to keep abreast of the times he would do well to subscribe for our journal, Gleanings in Bee Culture, an illustrated semi-monthly magazine devoted to bees. It contains a great deal of matter for beginners as well as for the veteran in the business. Price \$1.00 per year.

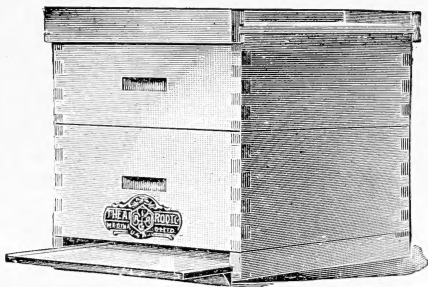
April 5, 1907.

The A. I. Root Co.,  
Medina, Ohio.

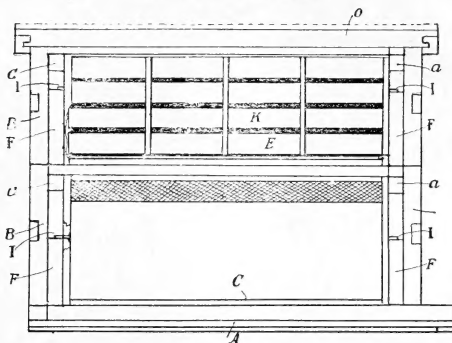
# Part I

## THE DANZENBAKER HIVE

The Danzenbaker hive in its present form has been on the market since 1895. It may be truthfully said

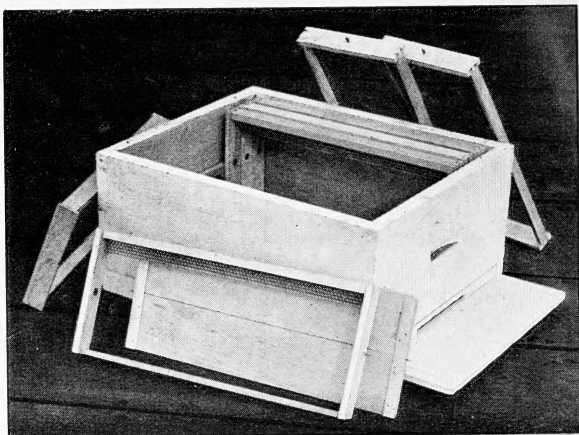


DANZENBAKER HIVE



that it has successfully passed the period of experimentation, and has now come to be recognized as one of

the standards. When it was first introduced, the bee-keeping world was not prepared to accept it. It was considered too revolutionary; it was not needed; but in spite of these objections the inventor, Mr. Francis Danzenbaker, then at Washington, D. C., persistently clung to the hive until he had one large manufacturer take hold of it and push it, but not till he had demonstrated that it had merits peculiar to itself. During the last few years bee-keepers everywhere have been taking hold of it.



EMPTY DANZENBAKER HIVE

[Showing division-board, frames, and the manner of their support in the hive.]

### The Question of Depth

The hive bearing his name uses the same kind of cover and bottom as are used on the regular ten-frame Langstroth. Any super or super combination that will fit standard L. hives can be used on the Danzenbaker. He, however, adopted a shallower brood-nest



by  $1\frac{3}{4}$  inches, and ten closed-end reversible frames supported in the center. He early observed that an ordinary colony of bees would place about two inches of honey above the brood in a Langstroth frame. He



HETHERINGTON-QUINBY CLOSED-END FRAME AND HIVE

reasons that, if this honey were crowded up into the supers by making a frame of less depth, such honey would bring the highest market price; and if the bees required feeding after the season was over, a cheap

## Facts About Bees

syrup costing 3 or  $3\frac{1}{2}$  cents per pound could be substituted for 15-cent honey. He accordingly reduced the depth of his frame at the very start to  $7\frac{1}{2}$  inches instead of  $9\frac{1}{8}$ , as in the regular standard Langstroth.



QUINBY FRAMES BEING HANDLED

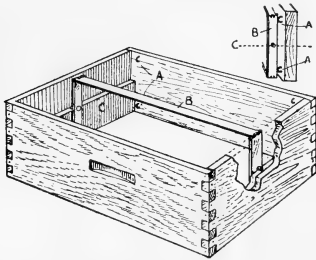
### Closed-end vs. Open-end Frames

Mr. Danzenbaker believes, also, from extended observation and from general inquiry among bee-keepers who have tested the matter carefully, that a large amount of colony heat was dissipated between the end-bars of the frames in the ordinary Langstroth hive. In talking with the users of the open-end frame he found that they readily admitted this loss of heat,

but concluded that what could not be helped would have to be endured. They would not tolerate the old Quinby closed-end frame—oh, no!—because they argued that would smash bees, and it would take a *crowbar*, after the bees had glued them together, to get them apart.

Mr. Danzenbaker went quietly to work experimenting, and found that neither assertion proved true in practice—or, rather, it would be more accurate to say that there was no necessity whatever for smashing bees; and so far as the difficulty of separating the frames was concerned, this was more in their imagination than in reality.

On visiting some of the most extensive bee-keepers in the country, who used such frames exclusively, he was gratified to learn that his own experience was con-



HOW THE DANZENBAKER FRAME IS SUPPORTED ON THE  
CLEATS IN THE HIVE-ENDS

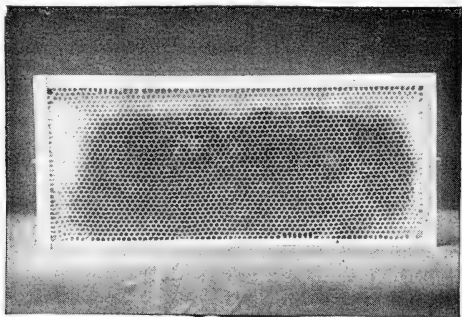
firmed. He found that it was no new thing for these men to handle colonies by the thousands on closed-end frames; and when anybody talked to them about such frames being “awful bee-smashers” they laughed at the very idea. Actual demonstration developed that they could handle their frames in pairs and in groups like so many chunks of cordwood. They could pull the brood-nest all to pieces; they could perform any one of the hundred and one manipulations without killing a bee, and yet, what was more surprising, be able to do just as much work (and in some cases more)

as those who were users of the old-fashioned open-end Langstroth frame. The evidence was overwhelming.

After settling on the depth of the hive, Mr. Danzenbaker adopted a modified form of the closed-end Quinby each frame supported by a pivot in the center of each end-bar. He early realized the value of the old saying, "While you are getting, get a plenty." He saw that, if a frame were supported in the center, such frame would be reversible—that is, it could be used either side up.

### The Value of the Reversible Feature in Frames

Old bee-keepers know perfectly well, that, with the ordinary top-supported or non-reversible frames, the bees will build their combs to within half an inch of the bottom-bar and there stop. This results in a waste of comb space, a waste of lumber that is not utilized, and, what is worse, makes a splendid hiding-place



THE REVERSING FEATURE OF THE DANZENBAKER, MAKES IT POSSIBLE TO HAVE ALL COMBS SOLID, WITHOUT ANY SPACE BETWEEN BOTTOM OF COMB AND END-BAR

where the queen may secrete herself when the apiarist is hunting for her. This can be overcome after a fashion in various ways by using full sheets of foundation and perpendicular wiring; but even then bees will be inclined to leave holes near the bottom edge, and it is

in these holes that the queen finds peculiar delight and secretes herself.

But there is still another objection—a new comb supported at the top and part way down the sides of the end-bars is liable to fall out through handling or extracting; and on a hot day it may melt down, bringing loss and destruction to a portion of the brood-nest. In more ways than one it will be seen that it is very desirable to have this air-gap or waste space filled with good comb, thus making comb attachments at top and bottom as well as on the end-bars, and no hiding-place for Mrs. Queen.

By this time the reader will readily infer that, by reversing the frame for a few days in a warm season, the bees will fill up this air-gap or waste space between the bottom edge of the comb and the bottom-bar with new comb, for it is a well-recognized law in bee economy that a comb that does not quite reach a support just above will be built upward until the attachment is made; but not so when the comb doesn't reach the support below.

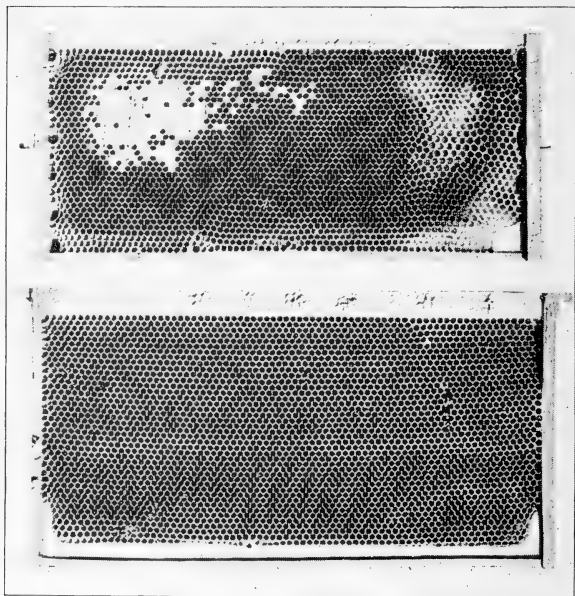
Taking advantage of this instinct in nature we can very readily make comb attachments all around by reversing a frame like the Danzenbaker, and have combs as solid, smooth, and perfect as so many boards. Nor is this all. A reversible moderately shallow frame does not require wiring as do the other deeper ones supported from the top. The reason of this is obvious, for a comb that has solid attachments to all four sides of the frame will be secured much more solidly than one that is fastened to the top-bar and half way down on each of the end-bars.

Still another fact. This reversing feature makes it possible to throw the honey in the top of the frames that may be left over from spring or summer into the supers, by turning the frames upside down, for the bees will not allow honey to be stored near the entrance or bottom-board, to remain there for fear of robbers. This gives added room for the queen.

And, lastly, the fact that a non-reversible frame will have in most cases waste space at the bottom not utilized, and a reversible frame *all* the space filled

with comb, goes to show that the former is really larger for a given depth, and is therefore more efficient.

But we have scarcely touched on the loss of heat that radiates away from the cluster when the ends of the



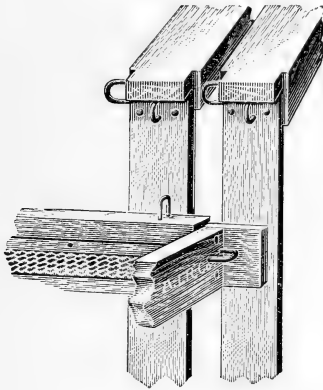
A DANZENBAKER REVERSIBLE AND A HOFFMAN NON-REVERSIBLE  
FRAME

[Notice in the lower frame that there is a space between the bottom of the comb and the bottom-bar that the bees won't fill. In the upper, Danzenbaker frame, there is no such space, for the frame has been reversed long enough for the bees to fill up this space.]

frames are left open. It is not unusual to have a regular closed-end frame with brood clear out to the end-bars; but it is rather the exception to have it reach

out that far when the ends are open so that chilling currents can circulate around, thereby chilling the young brood.

It is another principle in bee-hive economy that the bees strive to have their brood-nest as near 98 degrees as possible. If there is a chance for warm air to escape, the bees are compelled to contract the cluster, overfeeding on their honey in order to keep up animal heat and thus the brood-nest warm. The tighter and warmer this brood-nest can be, the fewer bees will be required to protect the brood, and the smaller the



Notice that the space between the end-bars of these frames are not closed and, hence, the heat of the cluster, so vital in brood-rearing, will be dissipated. This can not occur in the type of frames shown on page 12, and succeeding pages.

OPEN-END FRAMES

consumption of stores. But this is not all. Experience shows that bees will build up faster and better in the spring on closed-end frames than in the other condition where the space is open at the ends of the combs; and if they can do better work in brood-rearing in chilly or raw weather, they will certainly winter better in cold severe weather; and there are not wanting facts to show it. In the latitude of 40 degrees and under, the Danzenbaker hive will winter outdoors because of the closed-end frames and generally warmer

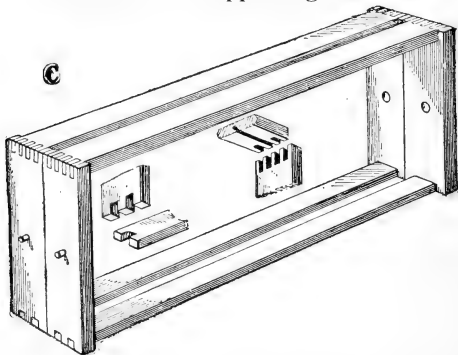
construction than the ordinary single-walled hives with open frames.

Many a bee-keeper who, having started to use open-end frames, has expressed the wish that he could get the protection of the closed-end frames. Most of them admit that such frames are warmer, and most of them wish they were able to take advantage of the closed-end frame feature of warmth without having to throw away their entire investment in the other hives.

This booklet will go to thousands of bee-keepers who are just starting in business; and it is of prime importance that *they start right*. A cold hive means a large consumption of stores, a larger sugar-bill for feeding in the fall, winter losses from dysentery due to over-feeding, and a consequent reduction of profit in the business.

But the reader will inquire whether it is necessary to put on additional protection above latitude of 40. We would advise it in most cases; but a further consideration of this subject will be found under the head of "Wintering in the Danzenbaker Hive," a little further on.

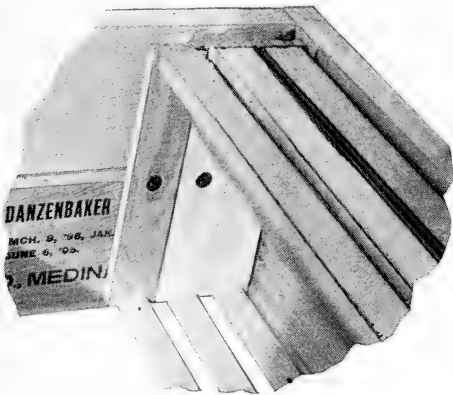
### The Manner of Supporting the Frame



We have discussed the value of the closed-end versus the open-end frames in bee-hive construction.



The question comes up, "How shall these frames be placed in the hive?" This was another mooted question with Mr. Danzenbaker; but he solved it very neatly by inserting a headed pin in the center of each of the end-bars. This he made the subject of a patent. But in making his frame reversible he put his support at such a point that there is but little or no danger of killing bees. A hanger cleat, a little less in width than the depth of the hive, is nailed on the inside of the ends of the hive body. The ordinary way of supporting closed-end frames is to put such support in the form of a strip of metal at the bottom, under the frames. This is tacked to the inside edge of the super or hive. When the frames are inserted they are almost sure to crowd bees down under the ends of the end-bars, mashing them between the end-bar and the metal



METHOD OF SUSPENDING DANZENBAKER FRAMES BY THE CENTERPINS.

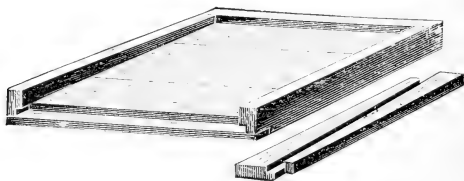
support beneath; but with the center-pin support, the apiarist can see exactly what he is doing; and as the point of contact is very narrow he is not liable to kill

any bees, even if he takes no pains to avoid doing so.

Mr. Danzenbaker also considered it important to put in a follower or division-board. The hive is, therefore, made wide enough to accommodate it and ten frames. In the case of a very weak colony this follower may be removed from the outside and placed next to the frame or frames containing the cluster of bees. This enables the apiarist to confine the heat to the cluster; as the cluster enlarges the follower may shove over and so on till the colony entirely fills the hive.

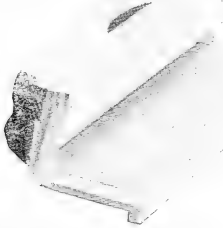
### A Variable Entrance

We have now described fully the inside structure of the brood-nest, and the reasons for its special construction. Carrying out the principle of conserving the heat of the brood-nest, the Danzenbaker bottom-board is so constructed that the entrance can be made large or small by changing the adjustment of the alighting-board. When the weather is very warm, and a new swarm has been hived in the brood-nest, it is desirable



to provide for a large amount of ventilation. The alighting-board is then drawn out entirely and placed in front of the hive, leaving an opening  $1\frac{1}{4}$  inches deep by the full width of the hive. After the swarm has quieted down, and less ventilation is required the plain side of the alighting-board is placed upward, one edge being pushed into the slot on either side of the side-rails of the bottom. This gives an entrance  $\frac{7}{8}$  deep by the width of the hive. When the robbing season comes on, or cool weather makes it desirable to reduce

the size of the opening, the alighting-board may be pulled out, turned the other side up, and the edges

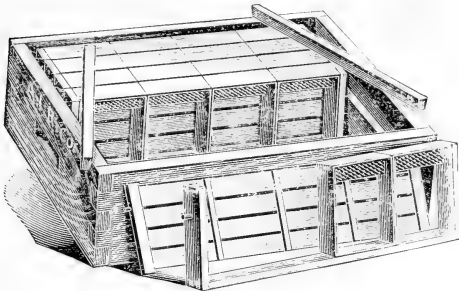


DANZENBAKER HIVE-ENTRANCE FULL WIDTH

reversed. When it is in position this will give a reduced entrance  $\frac{1}{4} \times 8$  inch, and will even then be small enough for outdoor wintering.

The general construction of the bottom-board as a whole is very light, and scientifically braced.

### The Danzenbaker Comb-Honey Super

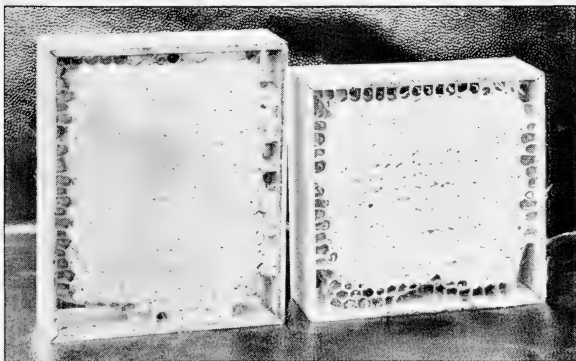


When this was first introduced it was a wide departure from comb-honey appliance in general use,

Although some features of it were not new, the principles had been in use by bee-keepers of extended experience for ten or fifteen years previous. Mr. Danzenbaker observed that the existing size of section among bee-keepers generally was  $4\frac{1}{4}$  inches square and very nearly 2 inches thick. This made a bulky comb of comparatively small amount of surface for display. In nature we find that the average of the combs are such that they can be used either in brood-rearing or for the storage of honey. As such, they are only  $\frac{7}{8}$  thick. The more we compel the bees to deviate from their regular preferred practice, the more they will be disinclined at times to enter the sections, no matter how much we desire them to do so. Mr. Danzenbaker found that Captain J. E. Hetherington, at that time the most extensive bee-keeper in the world (by the way, he used closed-end frames), was selling a section that was  $3\frac{7}{8} \times 5$ , and which held approximately a pound. This made a box taller than broad. He also learned that quite a number of prominent bee-keepers, including Mr. G. M. Doolittle, whose fame as a honey-producer is known the world around, was producing a section of similar proportions. In some of Eastern markets at least, Mr. Danzenbaker observed that these sections were outselling the square ones, and bringing a higher price. Inquiry revealed the fact that the consumer would take the tall section, not only because it had a more pleasing appearance, because it conformed in shape to most of the grocery packages, but that these tall sections actually looked larger, although they did not hold any more honey than the square ones. When he picked on the size of his section he adopted even inches,  $4 \times 5$ .

About this time the plain sections without beeways were coming to the front, and he was quick to see that honey in such sections looked better filled, and he therefore adopted as a standard for his hive the size of  $4 \times 5$ , plain, without beeways,  $1\frac{3}{8}$  wide or thick. This would give him a comb very nearly nature's apparently preferred thickness and very nearly an even pound in weight.

When he put this honey on the market in Washington the grocers complained that they could not sell their  $4\frac{1}{4}$  stock until the  $4 \times 5$  Danzenbaker plain sections were out of sight. The same experience was found



SQUARE VS. TALL SECTIONS

[Both hold the same weight of honey and both cost the same to produce, but tall section sells for more money in many markets.]

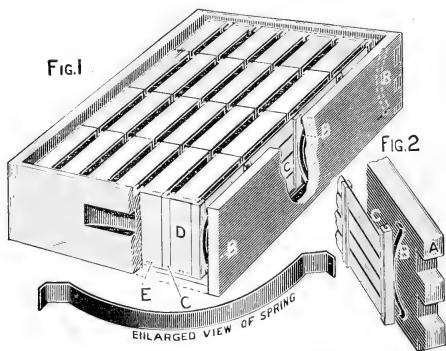
in other cities. In a word, Mr. Danzenbaker struck out from the old beaten path of  $4\frac{1}{4}$  beeway sections, and began to talk the advantages of the same weight of comb with a larger surface and more pleasing appearance.

### The Style of Comb-Honey Section

In the meantime he set himself ardently at work discovering the essential principles of comb-honey production. One of those principles was a warm super, and yet one that would give free communication from one section to another. The accompanying illustrations show the super with the fences, or separators, and the plain sections, and another illustration shows the  $4\frac{1}{4}$  section square and the  $4 \times 5$  side by side. Unless one were told to the contrary, he would naturally suppose

that the tall section was the larger. If they were sold at the same price he would take the large one of course. He would still take it if it sold for two or three cents more a pound. But the difference in apparent size is not the only one. A customer, without knowing it, prefers an oblong package—taller than broad. In our general architecture we are accustomed to see doors and windows of such proportions. In the groceries, most of the packages are of this shape. Then why should not bee-keepers cater to the same fashions and demand especially if the customer is willing to pay for it?

Another principle that Mr. Danzenbaker had impressed upon him was that it was important to have



DANZENBAKER SUPER

[The sections or honey-boxes are held in holders E; the fence is shown at C, C; and the spring to produce compression, at B.]

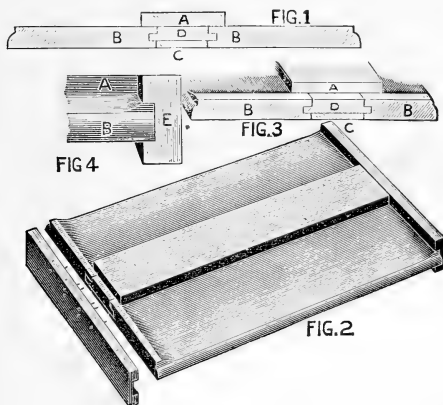
the sections and separators or fences squeezed tightly together in the super. In fact, the need of this is recognized by all comb-honey producers. Wherever there is an open crack or gap between the hive parts, the bees chink in bee-glue, making it necessary for the bee-keeper to do a lot of scraping in order to make his nice pearly-white sections look presentable for the counter. Something to cause a yielding pressure—a

pressure that will adapt itself to the swelling and shrinkage of the wood, is imperative.

At the apiary of Capt. J. E. Hetherington, to whom reference has already been made, Mr. Danzenbaker saw a curved steel spring that was pushed down between the sections and the sides of the super. Two or more would be used according to the number of the cleats on the separators or fences, and the general construction of the supers. The Hetherington spring was finally adopted by the manufacturers of the hive, and it is now used in the Danzenbaker supers, and nothing else has been found to be so useful, nor half so good for the money.

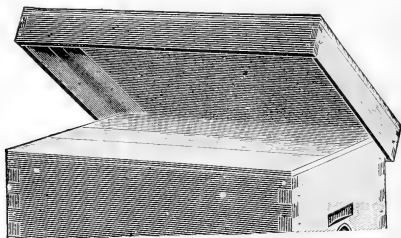
### The Cover for the Danzenbaker Hive

We now have left only the cover. This in its more simple form is made of three boards and two cleats, combined in such a way as to make a very stiff, ser-



viceable weather-tight hive-lid. But Mr. Danzenbaker prefers and uses a board  $\frac{1}{4}$  inch thick, bound at each end with metal binding to prevent warping. This is

put on the brood-nest or supers. Over this, still, he prefers a deep telescoping cover, to stand the weather, which cover is worth all it costs for the additional protection it gives to the comb-honey super during cool nights and inclement weather when the bees will stop comb-building and desert the supers at a time when the bee-keeper can ill afford it. If, on the other hand, the bees can be kept up in the supers, drawing out the comb when it warms up during the following day a large force of fielders can be spared to bring in the nectar, because additional storage room has been provided during the night. It is sometimes penny wise and pound foolish to save a little expense in making a super warm, for a fancy Danzenbaker section of honey will retail all the way from 15 to 30 cents in first-class stores and groceries. If a bee-keeper can, by an outlay of ten cents extra, get back anywhere from 25 to 50 cents more in honey, he still has an investment good for many years to come—that is to say, an extra investment of 10 cents



DOUBLE COVER

may earn for him during the next ten years anywhere from \$2.00 to \$5.00 more in the better quality and quantity of honey.

So far we have confined ourselves to a general description of the Danzenbaker hive and the reason for its special construction. We will now devote ourselves to its management.

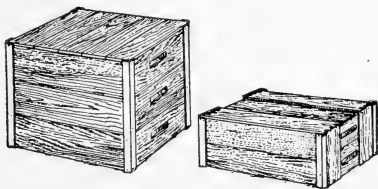


## *Part II*

### HOW TO START IN BEES

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The reader of this little work, having decided in favor of the Danzenbaker hive, will naturally desire to know how best to make a start with bees. As a general rule, we advise the prospective purchaser to get of his dealer a crate of five hives in the flat, in-

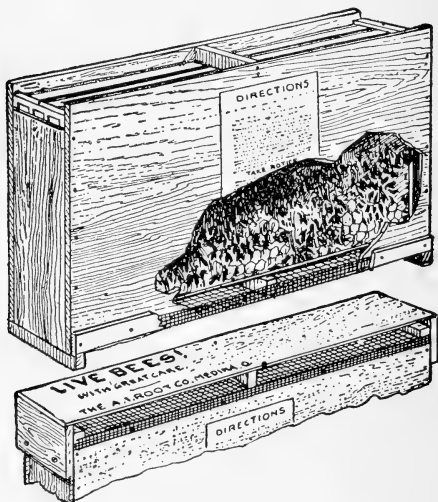


DANZENBAKER HIVES PACKED IN THE FLAT FOR SHIPMENT

cluding all the inside fixtures. We suggest getting five instead of one hive as the bees will swarm and require more hives, so that the whole five will possibly be needed the first season. Directions go with each hive for nailing together; and even the veriest novice at carpenter work will have no difficulty in putting the stuff together, for he can hardly get it together wrong.

After the hives are nailed up and painted, we recommend the buying of some bees of some farmer in the vicinity. If possible, purchase in movable-frame hives; if not, get them in a box hive and proceed to cut out the combs by the directions given under the head of "Transferring," a little further on in this work. If bees can not be obtained in the neighborhood, or if for any reason one feels a little timid about breaking into a box hive and cutting out the combs, perhaps he had better send to his dealer and get a two or three frame

nucleus of Italian bees and queen. This can be sent in a light shipping box, and the price will not be high in consideration of the fact that the bees are blooded stock, very gentle, and the frames are all ready to put into the hive.



A TWO-FRAME NUCLEUS SHIPPING-BOX

But if the expense is no item, and one desires to make a quick start without any fussing or delay, he would better get a full colony of bees in a ten-frame Danzenbaker hive, with a nice tested Italian queen.

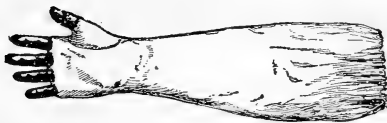
### How to Open and Examine a Hive of Bees

We will assume that you have a colony of bees in a Danzenbaker hive, and that the same have been placed in the back yard. You will now desire to know how to open a hive and how to handle it. If you have not

already procured them, you had better have a bee-veil and a pair of gloves with long gauntlets to protect the sleeves. Bee-men do not ordinarily need bee-gloves in handling bees; but where one handles them for the



BEE-VEIL



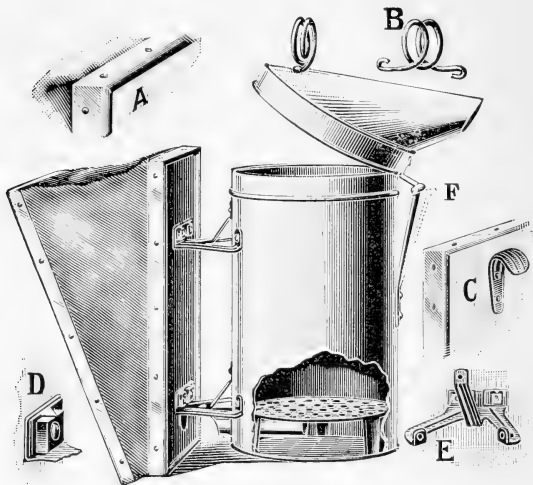
BEE-GLOVE WITH EXPOSED FINGERS AND THUMB



BEE-GLOVE WITH FINGERS

first time he might naturally feel timid, and the gloves will give him a little more self-assurance; and as he gradually learns the habits of bees he can dispense with gloves, and perhaps with the veil itself.

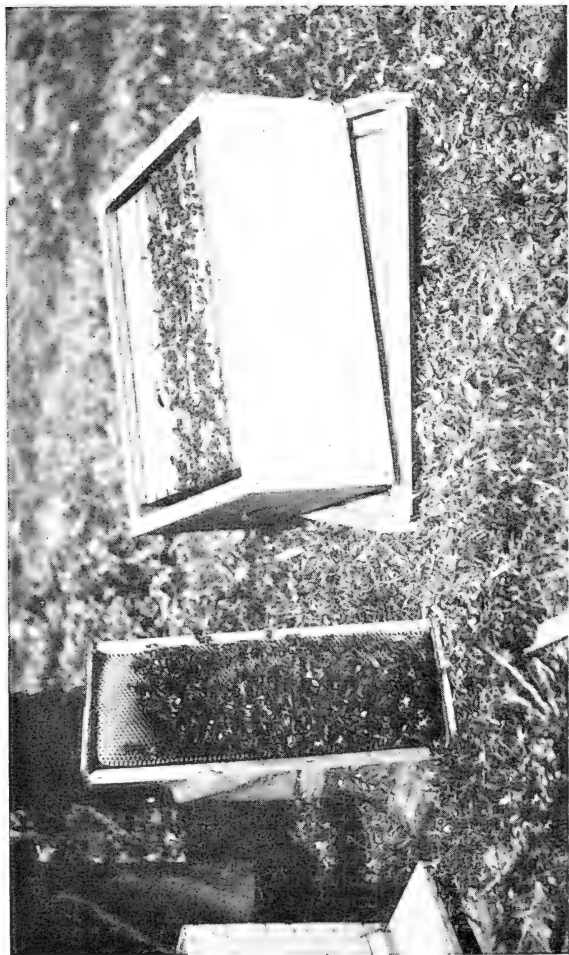
Another requisite is a bee-smoker. This is a little tool that has a bellows and a sort of stove attached to it, which, when burning fuel, will give the bee-keeper a large volume of smoke. For handling bees, smoke is practically indispensable. A few puffs of it on them almost immediately subdues them. The only danger



ROOT BEE-SMOKER

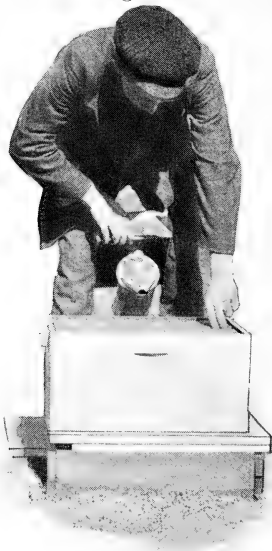
is that a beginner will use too much of it, driving the little chaps down between the frames, injuring the bees and starting a general roar of distress among them, for the poor little chaps have been subjected to real torture.

Now, then, having all the tools, bee-veil, gloves, smoker, etc., be sure to light the smoker and have it ready. Let us now open up the hive. Oh, yes! we need a screwdriver. Better go back to the house and get it. There, now we are ready. Blow three or four puffs of smoke into the entrance of the hive. This is to drive back the guards. With the screwdriver or



Manner of setting a Danz. hive on a hive-cover in such a way as not to kill bees. How a Danz. frame can be leaned against the leg.

hive tool enter the blade between the cover and the top of the hive or super as the case may be. (By super we mean that division or section of the hive that contains the honey-boxes, etc.) Keep on crowding the blade until a little gap of about a sixteenth of an inch is formed. Blow a little smoke into this gap. Now give the screwdriver a slight downward pressure, thus



Holding the smoker between the knees  
while handling the frames

making the gap wider. Blow in a little more smoke. Leave the screwdriver in place, with the right hand gently lifting the cover of the hive. We say "gently," because this is very important. A quick nervous jerky motion is liable to cause the bees to fly out and sting. As the cover is being lifted, with one hand blow a little



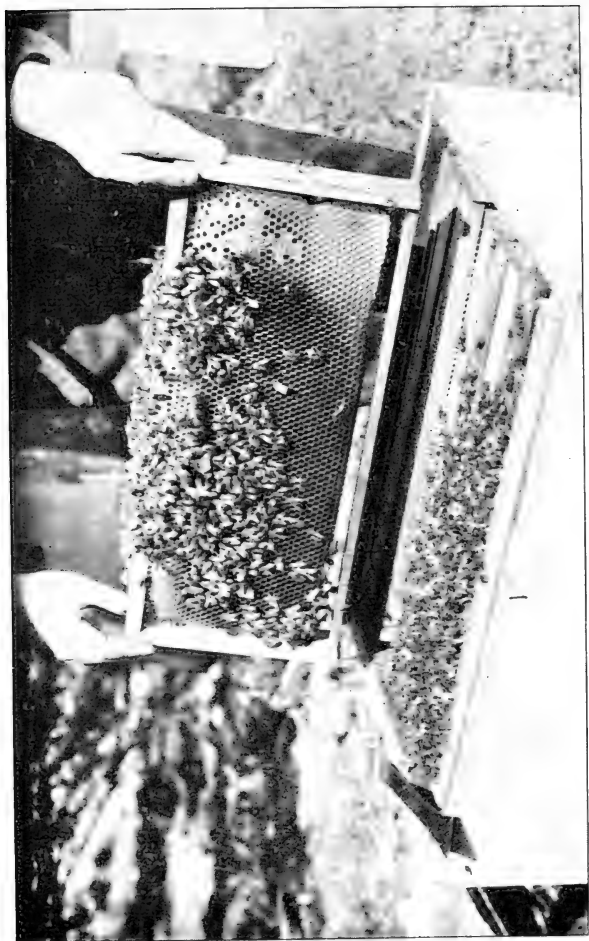
METHOD OF GRABBING DANZENBAKER FRAME WHEN REMOVING IT FROM THE HIVE

smoke—not much—over the tops of the frames. Lay the cover down in the rear of the hive, bottom upward. If there is a super on the hive remove this in precisely the same way, prying the screwdriver between it and the lower part of the hive, in the mean time using a little smoke. The super should now be set down on the cover in such a way that the diagonally opposite corners just rest on the cleats. This will leave a space of about  $\frac{3}{8}$  inch between the super and the cover.

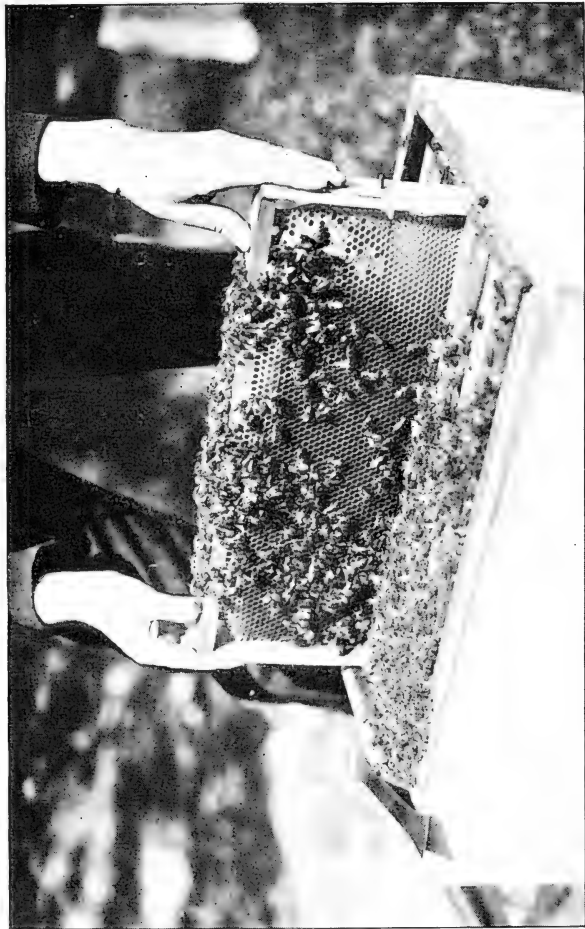
In handling bees, always make it a point to avoid killing or smashing them. A bee that is crushed carelessly is liable, by its little squeals, to start the other bees.

Well, now we are ready to remove a comb. Pick up the screwdriver with one hand and the smoker with the other. Enter the blade between a pair of frames, and give it a slight twist, blowing a little smoke down between; next loosen the follower, after which it may be removed. Break the connections on each side of the frame to be removed, then set down the smoker and the screwdriver. With the balls of the fore fingers passed down between the ends of the hive and the frames, grab hold of the end-bars of the loosened frame. Very slowly lift it upward. If you find it still sticks, pry the frames on each side a little further apart, when it should come out easily. When it is removed, look it over and set it down against the hive or some other object. Loosen up another frame in the same way. After examining the brood and the young bees, and after having found the queen (she looks like the other bees, only she is a little larger and longer) then proceed to close the hive up. Put one frame in at a time; but in doing so be careful not to kill any bees. This can be done by sliding the edges that come in contact with each other past each other on a perpendicular line in such a way as to brush the bees off; or, if preferred, a little smoke may be blown down between the edges that come in contact, driving the bees away; but if there are many bees in the hive this is impracticable. Insert all the frames one by one till all are in place, and then put back the follower.





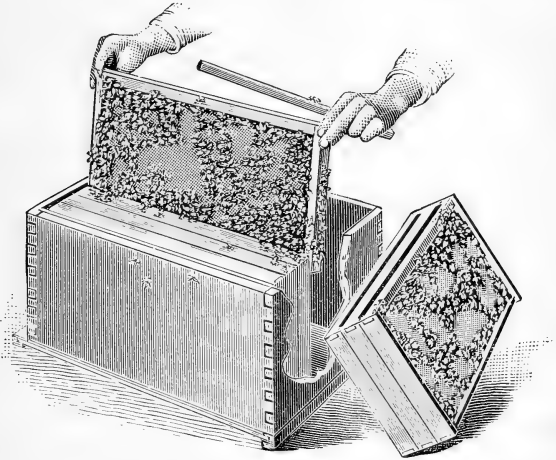
ABOUT TO INSERT A DANZENBAKER FRAME INTO THE SPACE FROM WHICH IT CAME  
| When in place, be sure and crowd the frames tightly together; this is important. |



SLIDING A DANZENBAKER FRAME DOWN BETWEEN TWO OTHERS

[If the spacing be an easy fit, any bees that may be on the end-bars may be displaced without killing one. When all the frames are in place, BE SURE TO CROWD THEM TIGHTLY TOGETHER. If left a little way apart, the bees will fill up the cracks with bee-glue, making separation afterward hard and disagreeable.]

As a general rule it is not necessary to remove *every* frame. The practical bee-man will soon learn how to tell from examination of a single frame what the whole colony is doing. If eggs and brood in various stages are found on the comb, it may be assumed that a queen is present. If the colony seems strong, and the bees are flying at the entrance vigorously to and from the fields it may be inferred that the queen is doing her full duty; so it is a general practice not to pull out more than one frame. If this is put right back into the



slot from which it came, even if the end-bars are totally covered with bees, they will be brushed out of the way in the operation. *and not a bee will be killed.*

### How to Make an Artificial Swarm

Suppose the colony has become so strong that you would like to make an artificial swarm by "dividing," as we say. Split the brood-nest into two or three divisions by means of the screwdriver and a little smoke. Each division of three or four frames held together by propolis connections can be removed in solid blocks

and inserted in one or more empty hives; and in this way the colony will be divided into two or three parts. If empty frames of foundation be now placed on each side of the bees thus removed, we shall have the nucleus of a new colony; but it should be understood that the flying bees will go back to the old stand, and an effort



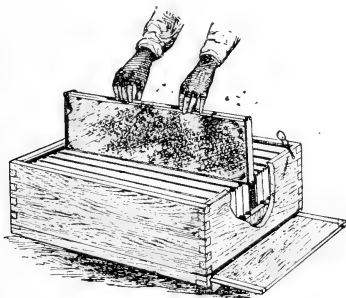
THE WRONG WAY TO HANDLE DANZENBAKER FRAMES

[The illustration shows the **WRONG** way to handle the Danzenbaker or any closed-end frames. They should **ALWAYS** be made to stand together in close contact of twos, threes, and fours. When so placed they will not tumble together in confusion, killing bees between the contact edges. The only way to straighten up a mess of this kind without killing bees, is to pick up one frame at a time and slide the edges of contact down past those of another frame; this will **SHOVE** the bees out of the way without killing or maiming any. If, on the other hand, they be pushed up together on their points of support **SEWISIDE**, the killing of bees will be inevitable. To save time, the frames should always be handled in blocks of two or more.]

should, therefore, be made to take the most of the bees away to the new stands, for the flying bees will soon go back and take care of any brood left at the old stand. In the course of two or three days an examination will show in which nucleus or division the

queen is present. If eggs are found, she is surely in that hive. If queen-cells are built, then just as surely she is not there. See how the bees supply themselves with a queen.

In these various manipulations, it will be seen it is not necessary to kill a single bee, and, what is more, the Danzenbaker frame can be handled in blocks of two or three. When so handled, the several frames in each block are not pried apart where stuck together with



#### THE RIGHT WAY TO HANDLE DANZENBAKER FRAMES

[Danzenbaker frames should not be pried apart singly, but in blocks of two or more. When so handled, they will not tumble over against each other, as shown in illustration just preceding. When a single frame is taken out, the next adjoining ones should be pried a little apart from it. It may then be removed, and when inserted in the same way, and all bees that may in the meantime have crawled over the contact edges will be shoved out of the way as the frame descends into position. Notice that the pin-support is out of the way where it can crush no bees. When the frames are in place, crowd them together tightly to keep out the bee-glue.]

natural bee-glue. With an ordinary unspaced Langstroth frame, a beginner, at least, would not be able to handle two or three frames at a time, for he would have to stick his fingers down between the several combs to keep them apart and from smashing bees, and run the risk of being stung; and if he were stung he would be liable to drop the frames and be a sadder and wiser man therefor, and in all probability he would never



HANDLING DANZENBAKER FRAMES IN GROUPS OF THREE AT A TIME.

[This illustrates how the frames can be handled in blocks of two or three at a time. The propolis or bee-glue holds them together while this is done. When the frames are in place, don't forget to crowd them up tight.]

want any thing more to do with bees. Right here the Danzenbaker frame allows one to handle two or three at a time, without any danger of a catastrophe of this kind. The Hoffman frames described in another booklet under the head of the "Dovetailed Hive" can be handled in the same way, and with the same facility.

### **How to Transfer from Box to Danzenbaker Hives**

The old-fashioned way, was to pry off the side of the box hive, cut out the combs, and fit them, after a fashion, into the brood-frames. But this takes a great deal of time, and at best it is a sticky, mussy job, to say nothing of the mashedup bees and stings, and finally the result is a lot of patched-up, crooked combs. The combs in box hives are usually so crooked, so old, and contain so many drone-cells, that it will be money in pocket to purchase brood foundation, fasten it into frames on wires ready to receive the transferred colony.

We will assume that your hive or hives, having been received in the flat, are put together and painted, and contain frames of wired foundation ready for the bees. Light your smoker and put on your bee-veil. Move the old hive back four or five feet, and put the new hive in its place. Prepare a small box about 18 inches deep and one side open, that will just cover (not slip over) the bottom of the box hive. Turn it upside down; set the hiving box over it, and then drum on the sides of the hive with a couple of sticks until about two-thirds of the bees pass up into the box. Gently lift off the box containing the bees, and dump it in front of the entrance of the new hive. Make sure that the queen is among them, watching for her as she passes with the rest into the entrance. If you do not discover her, look inside the hive. If you still fail to find her, drum out bees from the old hive again until you do get her, for, to make the plan a success, she must be in the *new* hive.

Return to the box hive, and turn it right side up and set it down a couple of feet back of the new one, with its entrance turned at right angles. You now

have in the hive about one-third of the original colony, the combs, and all the brood. Allow the old hive to stand for at least 21 days, at the end of which time the brood will be hatched out, with the exception of a little drone brood which will be of no value. Turn the hive upside down, and drum the bees out again into the hiving-box, after which dump it in front of the entrance of the new hive, as before. Next put an entrance-guard of perforated zinc over the entrance of the new hive. Smoke the bees of the hive, and then those in the hiving-box, after which dump it in front of the entrance to the new hive, as before. The smoking is to prevent the fighting on the part of the bees at the second drive, and the entrance-guard is to catch the queen or queens that have been raised in the meantime in the old hive. These one or two, if virgins, should be caught on the perforated metal and given to some queenless stocks. If the old queen in the new hive is a valuable one she should be caged at the time of making the second drive. If neither queen (the one in the old hive or the one in the new one) is valuable the perforated zinc need not be used.

The job of transferring is now completed, and all you have on hand is an old box hive containing a lot of old crooked combs, with perhaps a little honey and drone comb in it. The honey can be extracted, or used as chunk honey on the table, if fit for use. The rest can be melted up into wax, and the hive itself will make first-class kindling-wood, because it is smeared over on the inside with propolis and bits of wax.

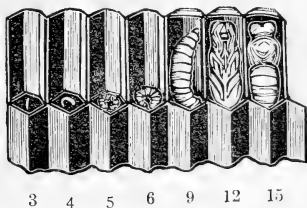
### The Inmates of the Hive

These consist of the workers, queen, and the drones, or male bees. The first mentioned are nothing more nor less than undeveloped females or queens. But because in babyhood they received a coarser food, and were confined, in a smaller cradle, so to speak, they are unable to perform the functions of a mother except under peculiar stress of conditions; and even then the



eggs that they may lay will produce drones and not workers or queens.

A queen as may be already inferred, comes from a worker egg. This egg will hatch in about three days, when a tiny grub will be found floating in a milky-white food; but at the end of the third day, if the bees intend to rear a worker instead of a queen, they will change the food, supplying a coarser pap that appears to stunt the growth of what might otherwise, with a richer food, produce a queen with all the reproductive organs properly developed. At the end of the ninth day the little larva that was intended to be only a worker has grown almost large enough to fill its tiny cell. The young bees only a week old, will then proceed to close up or cap this cell, when it takes on the imago form, or that of a true insect, with head, thorax, and abdomen. At the end of the twelfth day the eyes and mouth parts appear; and after eighteen days the insect becomes

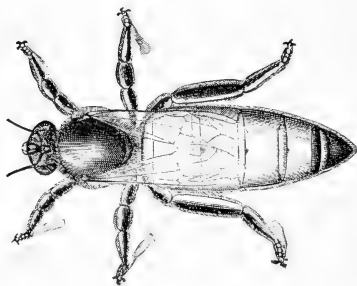


a perfectly formed bee, except that it is pearly white. It takes about three more days for it to turn yellow or brown or black, depending on the race of bees. At the end of the twentieth or twenty-first day it begins to gnaw its way out. As soon as it emerges it crawls out a feeble downy little insect with crumpled wings, rubs its eyes and combs its hair and finally dips its head in a cell of honey; but at the end of the third or fourth day it has come to be quite a bee. It has now assumed the duties of nurse in caring for the little grubs, leaving the other bees to bring home bee-bread, and nectar, which, by the process of inversion, is

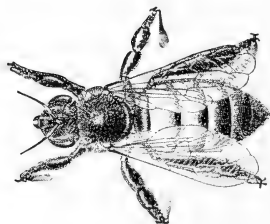
## Facts About Bees



DRONE



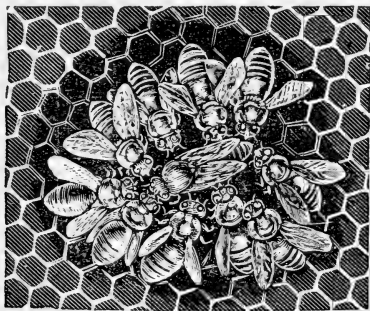
QUEEN



WORKER

finally converted into honey fit for the gods and man to eat.

The growth of the queen-bee is much the same, except that the very rich food or royal jelly, as we call it, is continued long enough to develop fully the reproductive organs. As this process continues her own body grows larger so that, across her waist, she measures 4-1000 of an inch larger across the waist than that of a worker-bee, and the length of her body is from a fourth to a half longer; and during the laying season it is larger in diameter. On the other hand her mouth parts seem to be stunted, so that while she may feed herself her subjects generally feed her instead.



Strange as it may seem, the queen may lay from 2000 to 3000 eggs a day, or an aggregate weight of them, if put on the scales, to equal the weight of her entire body, and all that in a single day! Just imagine, if you can, any hen that could perform a like feat. But that is precisely what a queen-bee does do, not only for one day, but for many days prior to and during the honey-flow. The queen's sting, also, seems to be somewhat aborted—a weapon that she very rarely uses except on a rival; and when she does make any use of it on a

human being the cases are so very rare that we may say she practically never stings any thing but another queen-bee.

But in order to give a complete life-history of her royal majesty we shall have to stop a moment and say something about her consort, the drone or male bee. This individual is quite striking in appearance, being much larger than a worker, clumsy in size and clumsy in movement. He is reared from an egg that produces only male bees, and such eggs are laid under normal conditions in cells of larger diameter, or what we call drone-cells. He is fed and nurtured in the same way that the queen and worker are cared for. In the course of time his waxen cell is capped over. But the capping, instead of being flat, is considerably rounding. The appearance, therefore, of capped drone brood is somewhat like that of a lot of small bullets or buckshot cut in halves and laid close together flat side down.

At the end of the twenty-fourth day the drone emerges, feeble and downy, and in general behavior acts very much like a worker that has just emerged.

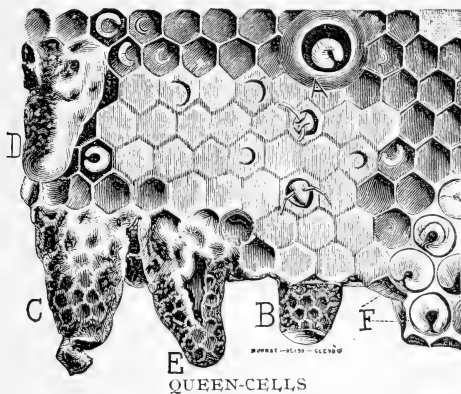
The drone serves no purpose other than to fecundate the queen, which act takes place only in the air—never elsewhere. Probably not one drone out of five hundred serves the purpose of his creation, since many drones are reared to one queen. At the end of the honey season all the drones, while not exactly massacred, are pushed out of the hive by the worker bees, where the poor fellows starve to death. But if, on the other hand, a colony be queenless or has a virgin queen, the drones are tolerated in the hive until Mrs. Queen has met a drone, when all the rest are rudely forced out of the hive only to suffer the usual fate of his kind.

### **How the Bees Supply Themselves With a New Queen**

From what has been already stated, the general procedure on the part of the bees has been given. During the beginning or height of the honey-flow the bees will prepare to swarm. When the old colony goes

forth with the queen, the bees will be under the necessity of having another queen left in reserve, so they will begin to feed a few of their very young larvae located at advantageous points on the comb with royal food. At this time they will begin to enlarge the cell or cells around these highly favored grubs. As the royal babies grow, the queen-cells—for that is what we call them—continue to be enlarged until at the end of the tenth day they stick out from the side of the comb like fair-sized peanuts. Their appearance is so very striking that the novice will have no trouble in locating them.

At the end of the sixteenth day from the laying of the egg, one or more queen-bees will hatch from one or



more of the cells; but just before this takes place the swarm will have made preparation, and will probably, on the first pleasant day, issue. Nearly all the bees will leave except a few young ones to take care of the brood and make a fair start. The first virgin that emerges, as soon as she has brushed her feathers and had a good breakfast, will proceed to destroy all the rivals in the other cells that may not have hatched.

In case she meets one that has come forth, a battle royal ensues until one or the other is killed; but the successful rival realizes the very great importance of promptly dispatching other possible rivals while they are in their baby state, and before they are able to put up a successful defense.

At the end of the fourth or fifth day after hatching, the young virgin, now monarch of all she surveys, takes a peep at the entrance, spreads out her silken wings, and soars aloft, but not till she has carefully marked her surroundings and the general location by many and many a circle, each circle becoming larger, until she hies herself away only to be met, probably, by a school of drones which immediately put out in hot pursuit. The swiftest-winged drone is the successful suitor; but during the process of copulation the queen tears herself away from him taking with her his reproductive organs, when he immediately drops as if paralyzed. If the first copulation did not impregnate, the queen may come forth again and meet another drone. At the end of the second or third day after mating, the queen will begin to lay; but if she does not meet the drone, or does not become impregnated, her eggs will produce only drones.

If we had the space, we might at this point go into the subject of parthenogenesis; but we respectfully refer the reader to our larger work, the *A B C of Bee Culture* for a full treatment of this subject.

We have already explained how a queen-bee is produced under the swarming impulse. The process of renewing queens may occur in precisely the same way if the old queen begins to fail through age or injury. Before she dies, the bees (expecting her demise) start queen-cells. When these are found in the hive outside of the swarming season, with the old queen present, the apiarist usually concludes that the bees are about to supersede her.

When the queen is suddenly killed or removed by the apiarist, the bees will immediately, with the eggs that are left, start several queen-cells for they recognize the fact that the very perpetuity of the colony depends on having a good laying queen, and, that they

may take no chances, raise several cells instead of only one that may fail.

In case there should be no eggs nor larvae from which to rear a good queen, the bees will use the largest larva, but such queens are usually inferior. If there is nothing from which to rear a queen, in a few days the bees will set up a wail of distress. It is a sort of low hum, which, to the experienced bee-keeper, indicates queenlessness.

Such, in brief, is the life history of the inmates of the hive; and for further particulars the reader is referred to our larger work, the *A B C of Bee Culture*, a cyclopedia of over 500 pages.

## *Part III*

### METHODS OF MANAGEMENT

#### Robbing

At the very outset it is very important that the novice understand that bees will steal from each other. There will be no trouble from robbing if there be only one colony in the vicinity; but if there be several when there is no honey to be secured in the fields, the foragers are watching their chances to steal from the house or honey from each other. At such times they will start a high keynote; and, if unrestrained, are liable to become quite cross. When the honey or sweet is cut off, then it is that their fury reaches its highest point, and they will sometimes sting viciously. It is then that the beginner may wish he never saw bees, and his neighbors too, for that matter.

When no honey is coming from the fields it is advisable to have the entrance contracted down to the smallest space; and if a colony be weak, say not more than one or two frames of bees and brood, the other bees are liable to pounce upon it. In such case we would advise taking the robbed hive away entirely and carrying it down cellar and leaving it there for two or three days. In the meantime contract the entrances of all the other hives down to the space that one or two bees can pass at a time. At the end of two or three days the robbed colony may be taken out at night, and

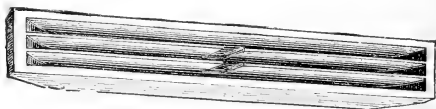
its entrance contracted down to about the space that one bee can pass and no more.

Never open the hives when the bees of other hives hover over the frames. But right here the question will arise, how is one to know whether the bees belong to other hives or not? Largely by their nervous actions, and whether the bees on the combs grab at any bee that attempts to alight on the exposed comb. Under such circumstances it is always advised to close the hive up immediately and contract the entrance.

Bees are liable to rob between the time of fruit-bloom and the opening-up of clover and basswood in the North; but if anything it is more serious after clover and basswood close in July or August. From that time on until the fall flow the bee-keeper must take extra precaution that his bees do not get to stealing from each other. During the canning season the women-folks are advised to keep the bees from coming in. As nearly every one uses fly-screens now, there will be very little trouble from that source.

### Feeding; How to Feed

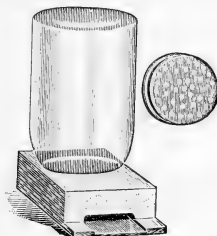
In the early spring, and after settled warm weather comes on, the bees will require to be fed, possibly. If an examination of the combs shows very little sealed honey, the bees should be given a sugar syrup made by mixing sugar and water, equal proportions, and stirring until the sugar is all dissolved. This should now be poured into a shallow pan, say about a quart, and the surface of the syrup covered with a sheet of wet cheesecloth to prevent the bees from drowning. The bees will



crawl up on the cloth, and take the syrup until it is all taken down and deposited in the combs. While this pan of syrup may be put at the entrance at night in



warm weather it is strongly urged to place the syrup in an empty super placed on top of the hive. Lay a couple of sticks across the pan, then cover the frames and the syrup with an old carpet or old quilt—any thing that will hold the heat of the cluster down.



BOARDMAN FEEDER

[This is an entrance-feeder. The projection fits into the entrance. The bees pass through the slot and take the feed through the perforations in the cap.]

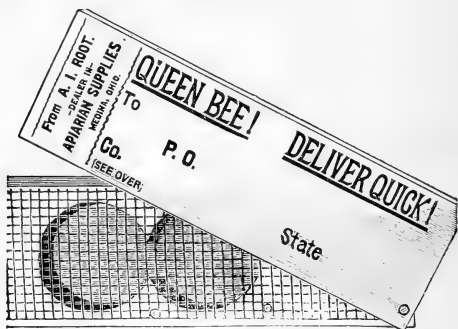
Excellent feeders for feeding at the entrance are sold, notably the Boardman. These can be obtained of the nearest dealer.

In cool or cold weather, if the bees are short of stores they should be given some kind of pure unflavored and uncolored granulated-sugar candy. This is made by pouring a little water on some granulated sugar, enough so that it forms a very thick syrup. This should be boiled to a "crack," that is to say, the finger should be dipped in cold water, then into the syrup, and *immediately* back again into the cold water. If the film of candy cracks when the finger is bent, the syrup may then be poured into greased tin pans, making cakes about  $\frac{3}{8}$  of an inch thick. These sticks of candy may then be placed on top of the cluster of the bees, and then the quilt placed on top of the whole. If it is not convenient to make the candy, loaf sugar placed in a shallow pan and wet down with a little water will answer nearly as well.

We would not advise giving liquid syrup, even in warm weather, if the bees have been robbing. In that case give the candy or the loaf sugar as just advised.

## How to Introduce a Queen

It may seem a little queer to the novice, but a strange queen must always be "introduced" to her new subjects

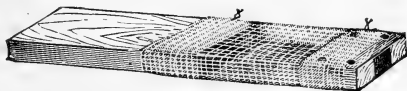


### QUEEN MAILING AND INTRODUCING CAGE

before they will accept her. It is a general law in bee-hive economy, that the bees under normal conditions will tolerate only one queen at a time, and she must have the same odor as they themselves. If she bears the smell of another colony she is considered an interloper, when they will immediately proceed to destroy her. A dozen or so will grab her by the legs and wings, and the result will be that Mrs. Queen will begin to squeal in real fright. This noise will excite the other bees, when they will all join in the melee. Hundreds of bees will cluster around about her, hissing and tugging at her; and so many will there be that it will be almost impossible for any one of them to sting her. The ball of bees will increase in size until it becomes as large as a double fist. Unless she is liberated she will be suffocated, if she is not stung to death. It is then that the apiarist, if he sees this bunch of bees, must use a smoker vigorously for a few minutes. This will scatter the rioters; and if the smoking be continued the queen can be soon found, picked up by the wings, and the bees in a like manner be pulled away

from her; but as this would be rather risky business for a beginner, he may find it more easy to drop the ball of bees into a pan of water, when it will immediately melt away, as it were, and the queen can be recovered and caged.

But we have not yet explained how to introduce a queen. The usual method is to put her in a wire-cloth



#### INTRODUCING CAGE

[Into the square hole in the end is pushed soft candy which the bees eat out, and release the queen.]

cage, one end of which is stopped up with a plug of soft bee-candy made by mixing powdered sugar and honey into a stiff dough. This plug of candy is covered with a thin piece of cardboard to keep the bees from eating the candy out too soon, and thus releasing the queen bee before her future subjects have become "acquainted" with her. The cage is then placed on top of the frame, and allowed to remain for 24 or 48 hours. The cover is then removed; and if the cardboard has not been gnawed away it is removed, when the hive is immediately closed. This should then be left for two or three days. At the end of this time the bees will have eaten out the candy and released the queen: for during the time of her confinement in the cage she will have acquired the same odor as the rest of the bees and be received as their own mother.

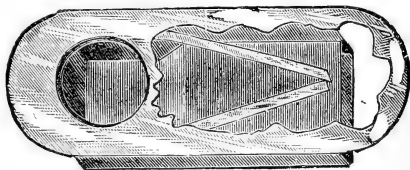
But let it be understood that it would be impossible to introduce a queen in this or any other way if there be another laying queen already in the hive, or if there was a young virgin; and it is difficult, often, to introduce when there are a lot of queen-cells in the hive, especially if such cells are liable to hatch soon. Before attempting to introduce, *destroy all cells and make sure that no other queen of any kind is present in the hive.* When getting a queen from a distance it is advised to remove the old queen and kill her, then cage the new one at the same operation. Do not make the mis-

take of waiting two or three days before the new queen is put in the hive.

### How to Produce Comb Honey

It is presumed, of course, that the beginner, if he has a colony of bees, has already purchased comb-honey appliances consisting of honey-boxes, comb foundation, and supers (or upper stories) that fit on the hive that he has purchased. These ought all to be prepared and be in readiness before the honey-flow comes on. As it often takes some time to get the supplies from the factory it is advised to place the order for such goods early in the season. The section honey-boxes should be folded up and the little strips of foundation should be inserted in the section.

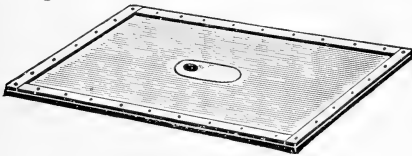
Along about the middle of June, in northern localities, when the bees begin to crowd the brood-nest with honey, and the top of the combs begins to whiten,



BEE-ESCAPE

especially if the field bees are going in and out of the hive rapidly, it is advised to put the super with sections on top of the hive, then the cover. This will give the bees extra room; and if all goes well they should begin to draw out the comb foundation and start work in the section honey-boxes. But suppose they fail to do so. In that case the honey-flow is not strong enough, or else the colony is too weak in numbers. Some seasons the flow is so light that the bees can not be forced above by any amount of coaxing; but it sometimes happens that, even with a good flow and a good colony, the bees fail to go up in the sections. If one has them, sections partly drawn out the previous season can be used to advantage. Put one or two of these in the place

of a section or sections of foundation. These are called "bait combs," and as soon as the bees commence to work in these and then in the other sections there will be no further trouble so long as the honey-flow remains good. As soon as the bees are nicely at work in all the sections, and get them about half filled with honey, place on top another super for two or three days. In case they fail to enter this second set of sections, lift the first super up and put the second one *under it*. When they are nicely started in the second super, reverse the position of the supers, putting the first one next to the brood-nest. The object of this is to get the first set of sections nicely and evenly filled out and capped over. When all the sections are filled—that is to say, finished—remove the first super, drop the second super down on to the hive and put on another one, and so on continue the process as indicated. As the honey-flow begins to slacken, no more super room should be given; otherwise the bees will begin to work in a lot of sections and never finish them. It is desirable to have all the sections finished at the close of the season. Doubtless the second super, if filled and completed, will be all the honey that one will be able to get in a season, but one may in a good flow, with only a few bees in a locality, be able to obtain three and possibly four supers, and in some rare instances five and six, if the colony be strong and the honey-flow good.



**BEE-ESCAPE BOARD**

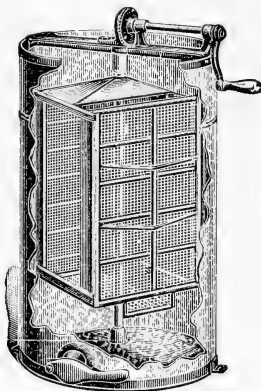
[The bees of the super can pass down through the hole in the escape board into the hive or brood-nest; but they can not go back.]

After a super of sections is finished it should be lifted off and a bee-escape placed under it. At the end of 24 hours the bees will have gone through the bee-escape down into the lower super or hive, leaving 28

sections clear of bees ready to take in the house to use or for the market. But if the honey be sold, the stains of bee-glue should be nicely scraped off with a case-knife so that the sections will present a nice clean appearance.

### How to Produce Extracted Honey

This is very much simpler, involving less skill and knowledge than the production of comb honey. All that is required, usually, is to give the bees an extra story with frames of foundation or empty comb. As fast as the bees fill it, add another super or upper story containing combs or foundation, and continue on



HONEY-EXTRACTOR

[Two combs are put into the baskets of the machine—the turning of the crank subjects the combs to a high rotative speed, the centrifugal force of which throws the honey out without injuring the combs, which may be used again.]

as long as the season lasts; but if one has no extra supers he would be compelled to “extract.” For this purpose he will need a honey-extractor and an uncapping-knife, which he can obtain of the supply-dealer. As these will be required in any case, no matter which

plan he pursues, the sooner he procures them the better.

A beginner, at least, is advised to use a bee-escape as mentioned under "Comb-honey Production." To



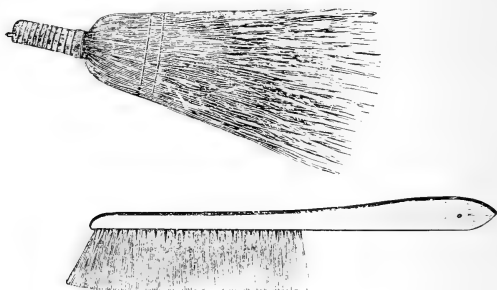
#### HOW TO BUMP THE BEES OFF A COMB

[The method here shown illustrates one plan of jarring the bees off by a sharp, quick blow of the fist on the back of the hand holding the frame.]

get the bees off the combs, this bee-escape board should be placed between the extracting-combs and the brood-nest, forcing all the bees out into the lower compartment. If put on at night the super will usually be found

free of bees in the morning. If bee-escapes are not used it will be necessary to brush or shake the bees off the combs one by one. Special bee-brushes with a soft sweep are provided for the purpose by the dealers. If these are not at hand a handful of long grass or weeds answers a very excellent temporary purpose.

The beginner should be cautioned to tuck the end of his pants legs in his stockings, and remove his coat and



BEE-BRUSHES

vest, before he shakes or brushes the combs. Some may prefer to use bicycle pants-guards to hold the pants tightly around the shoe. In any case, the clothing should be so adjusted that no bees can crawl up under and get next to the wearer.

The extracting should be done inside of the house or some closed room, screened in such a way as to shut out flies and bees. With the honey-knife the thin film of wax covering the cells should be sliced off. In order to work rapidly and easily the knife should be put into a pan of water kept at a temperature of about 100 degrees. To work to the best advantage one should have an uncapping can or box. For particulars regarding this see a dealer's catalog of bee-supplies. When the combs are uncapped they may be placed inside of the



honey-extractor, when a rapid turning of the handle will throw the honey out. As there are two surfaces to every comb, the combs should be reversed either in the



ANOTHER METHOD OF SHAKING BEES OFF THE COMB

[A strong hold on each edge of the frame is taken; it is then given a quick jerk downward and upward. If done right, it will dislodge all the bees.]

extractor, if it be a reversible machine, or out of the extractor if it be a non-reversing type.

When all the combs are empty on both sides they may be placed back on the hives for the bees to fill again, and so on, the process to be repeated as long as the season continues. But if the extracting be done

after the honey-flow, extreme care should be used not to let any robbers get started.



### How to Control Swarming

This is a mooted question, even among the veterans; but under some conditions, at least, and a reasonable amount of care, a fair degree of control can be secured. In the production of extracted honey the problem is comparatively easy.

Perhaps the most popular method employed is what is known as the clipped-wing plan. The queen's wings

should be clipped on one side (which method will be described presently) and the bees given plenty of room above for the storage of honey. A strong colony that shows indications of swarming should have all the queen-cells cut out if any are built. Precaution should be taken not to miss a single one. An upper story with empty combs of foundation should then be placed on top, with a frame or two of brood above, supplying their places in the brood-nest with frames of foundation. As fast as the bees begin to draw and fill their combs, put on more extracting-supers as directed under "Extracted Honey." If, perchance, a swarm should come forth it can not very well leave, as the queen's wings are clipped. She will come out with the swarm, and, failing to fly, will hop around in the grass, and finally return to the hive. The swarm, after finding she is not with them, will return; but when such a swarm has once come out and returned it should not be allowed to repeat the attempt. The shook or brushed swarm plan should then be practiced, which plan will be described later.

But the control of swarming in the production of comb honey is much more difficult. Sometimes before the bees enter the supers they will sulk by hanging out at the entrance, and finally swarm. In all modern well-regulated apiaries the wings of the queen are clipped after she begins laying. This work is usually done in the spring, when there are fewer bees and less difficulty in finding her. Many apiarists think it advisable to let their first swarm issue, then cut out all cells but one. While it is in the air the ground is carefully examined in front of the entrance, to discover the clipped queen. When located she is caged, and an empty hive, with empty combs or frames of foundation, is put in place on the old stand. The caged queen is placed in front of the entrance of new hive now on the old stand when the super that was on the old hive now set to one side with its drawn comb is placed on top. Last of all the old hive is then carried to a new location. The swarm soon returns, and, finding their queen in front of the hive, rushes in pell mell. The queen is next released when she goes in. The first

honey that comes in will necessarily have to be stored in the supers, just where it is wanted, providing foundation is used. Some go so far as to use only starters. In any event it is advisable to use foundation rather than empty combs. In either case there will be no swarming by that colony again, and the bee-keeper will be in shape to get a good yield of honey providing the season is good. The old parent colony on its new location will be so depleted in numbers that all cells and all virgins will be destroyed but one, and there will be no swarming from the parent colony.

But there may be some who necessarily have to be away during the middle of the day. In that case we would advise that the same plan of procedure be carried out as already outlined, except that the bee-keeper himself makes the bees swarm at his convenience—that is to say, he removes the old hive from its stand and puts a new one with foundation in its place. He should then open the old hive and shake two-thirds of all the bees on the ground, in front of new hive, compelling them to crawl in just as they would if they had swarmed out naturally and returned. The parent hive should then be taken to an entirely new location, and the super that was on it (providing there was one) should be put on the new hive, now on the old stand, into which the shaken swarm has gone.

In the meantime the colony in the parent hive moved to the new location, owing to the sudden depletion of the working force, will give up all idea of swarming; but it would be a wise precaution to cut out all the cells but one. In the meantime the shaken swarm on the old stand in the new hive will deport itself very much as if it had swarmed naturally, and all the flying bees from the new or old hive will all unite with it. They will begin drawing out the foundation; and as fast as they do this the queen will occupy the cells, so that all the honey that comes in will necessarily have to go into the supers.

Some practice a slight modification of the foregoing method by putting the parent hive a few feet to one side, the entrance facing in the same direction. All cells are destroyed; and after the brood is hatched

out, which should be within three weeks, the bees are shaken in front of the one containing the first drive of bees, or what was originally the old stand. The old hive is then taken away entirely. In this way, all brood, when it hatches out, will be given to the original shaken swarm; and with such a force of bees one is prepared to get honey.

But when one practices this method of making artificial, shaken, or brushed swarms, he should remember that probably nothing will be accomplished in swarm prevention by shaking unless the bees *are actually preparing to swarm*. They must feel a desire for it to the extent of making preparations, such as queen-cell building, whitening the tops of the combs, or hanging out in front of the hive. Then when shaken they will deport themselves very much as if they had actually swarmed.

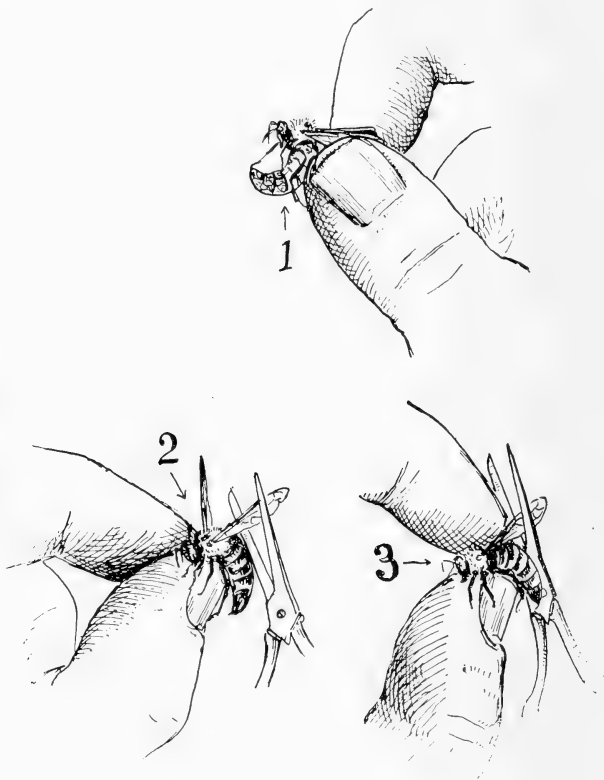
The advantage of shaking, as above described, is that it permits the bee-keeper to take care of the swarms at *his convenience*, not at some time when he is compelled to be at his office or away from home, or out on the farm beyond the call of the house.

### How to Clip the Queen

In the first paragraph on this subject of swarm control reference is made to the matter of clipping a queen's wings. For the benefit of those who may know nothing of the method of procedure, we will state that it simply means catching the queen-bee and clipping the wings on one side. This is usually done with a pair of scissors, or it may be accomplished with a sharp knife. But the novice perhaps will be afraid to attempt the job for fear he might mutilate or maim the queen, and this apprehension on his part will be greater if the queen cost him three or five dollars.

In order to acquire some skill in catching queens for the purpose of clipping he should practice picking up drones off the combs by the wings. When he becomes sufficiently proficient in this he may then attempt a worker bee; but he should so catch the wings that

the worker can not turn around and sting. When he can catch both drones and workers, then he can with

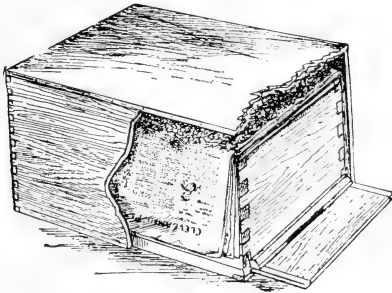


some degree of assurance pick up a queen. This done, he should now transfer her to the left (or free) hand, and this may be done by taking hold of her waist be-

tween the thumb and forefinger of the free hand. This will leave the wings exposed, when, with a pair of scissors, the wings on one side can be easily clipped. Grab the unclipped wings, then poke her nose between the combs, let go, when the job will be done.

### How to Winter in the Danzenbaker Hive

Toward the first of September all colonies should be examined to see if they have sufficient stores and a good queen. If there be no honey-flow they should be fed until the combs are well filled with stores. The bees may require to be fed again in November before



Method of wintering in Danzenbaker hive  
with winter case

they take their long winter's sleep, for during cold weather they go into a sort of quiescent semi-hibernating state, when the consumption of stores will be light.

As the weather becomes colder a cluster will draw up smaller until a large colony will be compressed into a space not much larger than the double fist. This is done on the part of the bees to maintain body heat and prevent being chilled to death. But in order to forestall too large a consumption of stores, inducing disease,

it is advised either to carry the bees into a darkened cellar or put a Danzenbaker winter case over the hive and winter out of doors. Between this case and the hive proper should be placed folds of newspaper; then when neatly tucked over the top of the hive the winter case should be shoved down over as shown in the illustration. But in order to use this case a super-cover must be used in place of the regular hive-cover that may have come with the hive. If one purchased a Danzenbaker hive with the telescoping or K cover, he secured with it a thin board bound at both ends with metal and of a width and length equal to the width and length of the hive. This is called a super-cover, and is, in fact, a part of K-cover equipment. The entrance should then be contracted, if it has not already been done, by reversing the alighting-board so that the appearance is the same as shown in the illustration.

This arrangement of wintering in the Danzenbaker hive will give excellent results up to a latitude of about 42 degrees, but much beyond that we would advise cellar wintering, providing the proper cellar temperature can be maintained. When settled cold weather comes on, which in some localities is about the first of December and others the first of January, if the indoor method is to be followed, all the hives should be carried down into a darkened cellar where the temperature can be kept, as nearly as possible, uniform at 45 degrees. If the temperature has a tendency to go up to 65 at certain times, and down to freezing at other times, it will be a poor cellar in which to winter bees. In that case we would advise the outdoor method with a winter case, and in addition to this a high board fence around the bees, or otherwise protect them by a barn and other out-buildings so that the prevailing winds may be cut off; for the more protected the spot where the bees are kept, the better they will winter.

If cellar conditions are favorable, the hives should be piled one on top of the other; but instead of giving them a contracted entrance the alighting-board should be reversed, giving an entrance  $\frac{7}{8}$  by the full width of the hive.

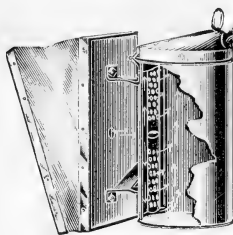


### **ADDENDA**

Some have reported that, with the Danzenbaker hive, or other shallow hives, the bees are inclined to store pollen in the sections. This difficulty can be easily overcome by having in the brood-nest a comb of pollen on one side. The presence of this pollen below will induce the storage of more pollen at the same place, keeping the sections clear and for the storage of honey only.

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