



# Non-Langstroth Hive Designs

A journey through hive design creativity  
pre-Langstroth and beyond



15+ year hobbyist beekeeper – 15 to 20 hives

## **INTRODUCTION – Kevin Inglin**

EAS Master Beekeeper

Past President – NWNJBA

Day Job > Medical Affairs IT, Bristol Myers Squibb

Beekeeping Podcaster

Managed Mentoring Program for Getting Started in Beekeeping

# **Our Home Yard**

## BEE “VESSELS”

The origin of hives – Pre Langstroth and Langstroth and beyond



## ALTERNATIVE HIVES

Envisioned and, in the marketplace  
Creativity of hive design – a gallery of hives



## HIVES IN PRACTICE

Envisioned and, in the Marketplace  
Hives in use around the world: What, where, and why..



## HIVES AROUND the WORLD

My Journey Abroad, and the Hive and People Encountered



## HIVES AT HOME

My Direct Experience with Different Hive Form Factors



## ARE YOU ALTERNATIVE?

Is this interesting. If so, some tips to follow for experimentation



# BEE “VESSELS”

The origin of hives – Pre Langstroth and Langstroth and beyond

# Vessels: Early Days

## □ The Tree

- *Climbing trees or cliffs to get to cavities for honey and comb.*

## □ Earthenware

- *Clay or mud pots to host colonies, sometimes in boles*

## □ Barrel

- *In West Africa barrels, imported by the Portuguese, were adapted for use as hives.*

## □ The Gum

- *Hollowing out trees for the purpose of housing colonies...*

## □ The Skep

- *No wood, no problem... Hives made from reed or straw, sometimes cloamed.*

## □ The Gourd

- *The gourd provides a natural hollow for bees, but most gourds are too small for an average bee colony, so that their use often induces swarming.*

# Vessels: Woodenware

## □ The carboy box

- *Precursor to a hive body?*
- *There is some speculation that these storage/shipping boxes had some influence on the woodenware that ultimately became the Langstroth hive*



# Vessels: Langstroth *Hive of today*

Dzierzon  
[JEER-ZON]

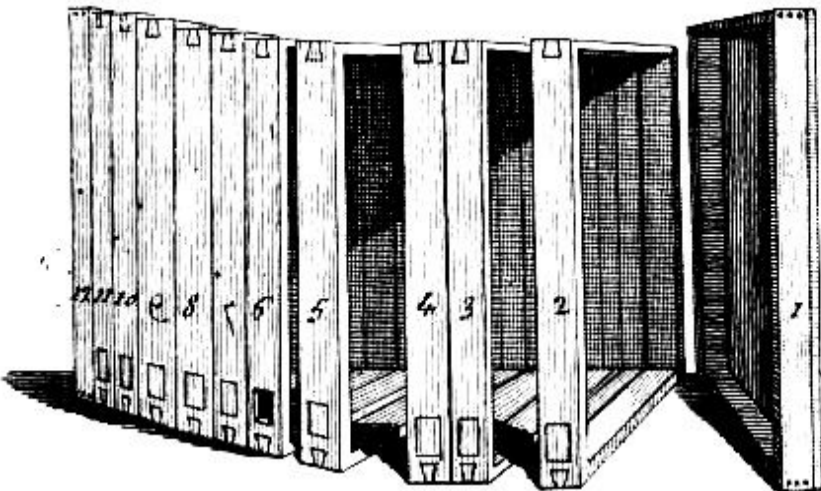
Influenced by  
Huber and Dzierzon's designs

# Vessels: We got there by way of...

## □ Huber's Leaf hive

• *Francois Huber* **1789**

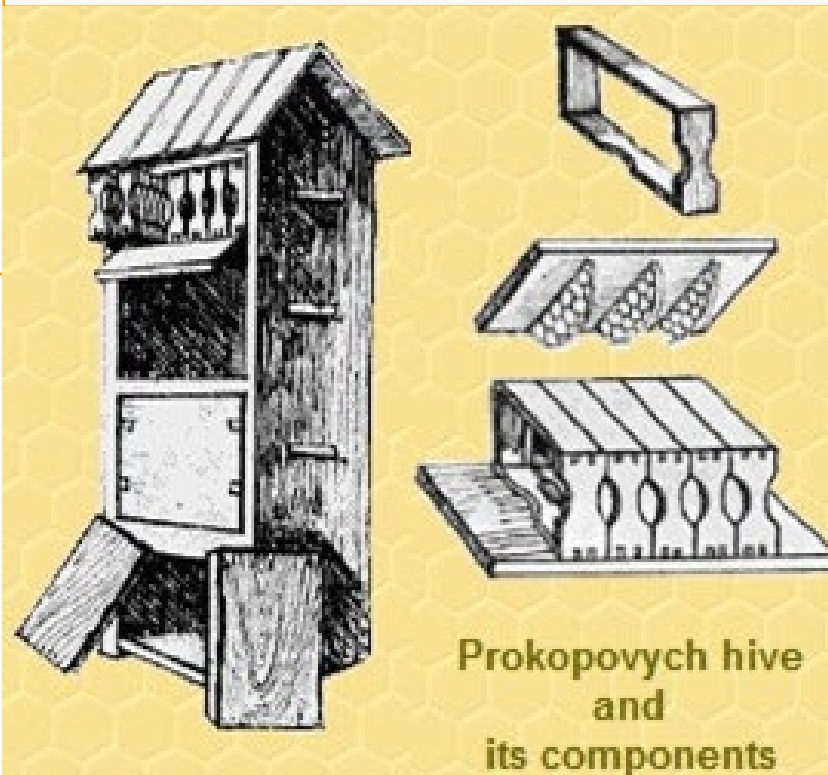
- The leaf hive was a fully movable frame hive, but had solid frames that were touching and made up the "box".
- The combs in this hive were examined like pages in a book.



## □ Prokopovych designs

• *Petro Prokopovych* **1814**

- Ukrainian beekeeper constructed the worlds first dismountable frame hive and wooden partitions



Prokopovych hive  
and  
its components

## □ Dzierzon's designs

• *Johann Dzierzon* **1835**

- Some indicate that modern designs, and specifically Langstroth's designs, may have been derived by Dzierzon's designs.
- Dzierzon, like others, affixed the frames in a container (shell)

## □ Langstroth

• *Lorenzo Langstroth* **1851**

- It is said that Langstroth had access to Dzierzon's translated manuscripts.
- Bee space and moveable comb systems in 1851 and 1852



# ALTERNATIVE HIVES

Envisioned and, in the marketplace  
Creativity of hive design – a gallery of hives

# The Bee Box Hive

## □ Unique Features

- *Urban beehive that solves the problems of stinging insects in a close environment – and easy honey harvesting!*



bee chimney

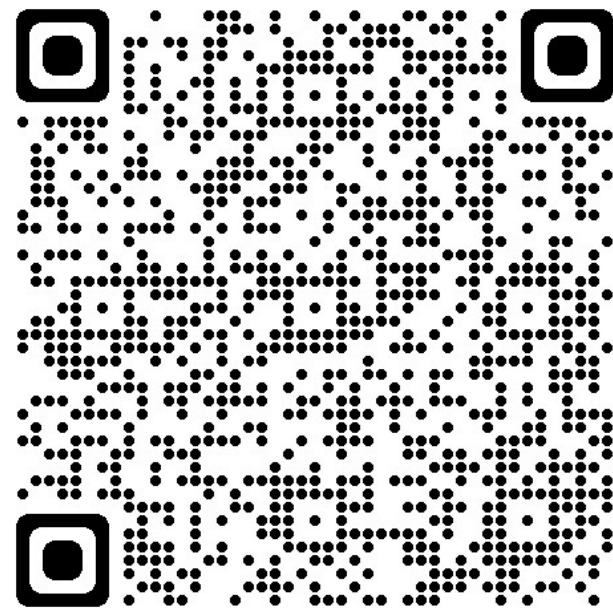
modular  
honeycomb

\*patent pending

honey  
harvesting  
system

customizable  
hive

bee  
viewer



INDEMAND

## B-box: 1st Ever Hive Designed For Home Beekeeping

Safe, Simple, Urban Friendly. The game-changer for backyard or balcony beekeeping.

beeing

Beeing acme21 srl

1 Campaign | Milan, Italy

**\$305,212** USD by 472 backers

\$238,702 USD by 391 backers on Aug 8, 2019

SEE OPTIONS

FOLLOW



## ❑ Modular Honey Chamber

- *It features a one-way compartment that would allow for bee escape*
- *Once the bees vacated, you could lift off the lexan cover and harvest the honey cartridges*



# The T-Slant Hive

- The premise of this hive is:
  - *The bees start at the top of the hive and work their way down.*
  - *Question is how the heck would you work it?*



# The T-Slant Hive Became the **Colony Beehive**

It was sold for a period of time from this website: [colonybeehive.com](http://colonybeehive.com)



# Birkey Hybrid Top Bar

## Inventor Goal

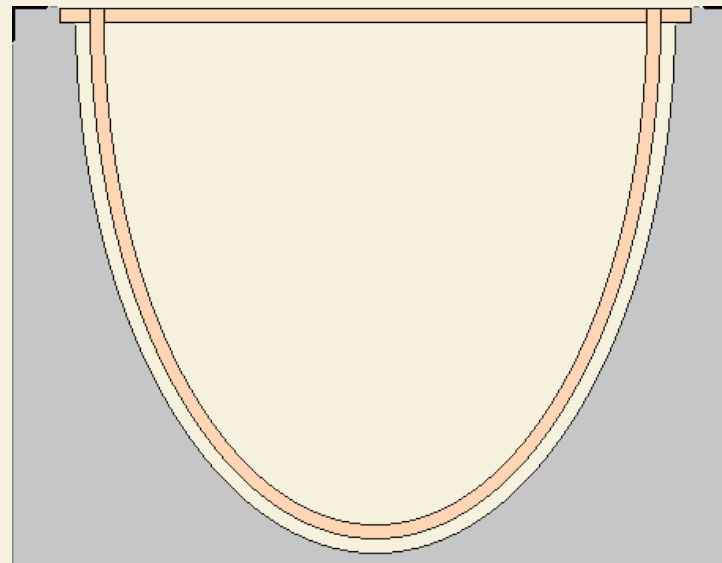
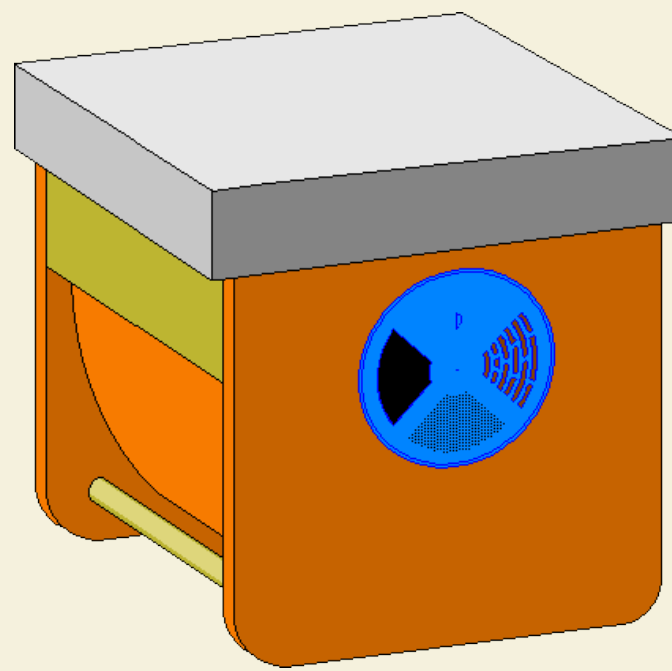
- *With a bottom strip the bees will not affix the comb to the hive woodenware interior*
- *The design supports soft comb for less breakage*
- *It also allows for a natural free hanging shape as nature intends*



# Birkey Hybrid

## INSPIRATION?

- The **Birkey Hybrid** has a similar construct to the British Bielby 1968 design called the **Catenary Hive**
- Both follow the principle that bees will naturally build their honeycomb to fall into a loop shape on the bottom
- Much like a rope that is left to hang freely
  - This principle is throughout nature
- It is represented by the math shown and is commonly referred to as **golden ratio**
  - It also known as the divine proportion, golden mean, or golden section



[Catenary Bee Hive \(dave-cushman.net\)](http://dave-cushman.net)



for Fibonacci numbers  $F$

$$F_i = \frac{\varphi^i - \psi^i}{\sqrt{5}}$$

, where  $\psi = \frac{1 - \sqrt{5}}{2}$

$$\varphi^n = F_n \varphi + F_{n-1}$$
$$\varphi = \lim_{n \rightarrow \infty} \frac{F_n}{F_{n-1}}$$
$$\varphi^2 = 1 + \varphi$$
$$\varphi = \frac{1 + \sqrt{5}}{2}$$
$$\varphi^n = \varphi^{n-1} + \varphi^{n-2}$$
$$\sin\left(\frac{\pi}{2} - i \ln \varphi\right) = \frac{\sqrt{5}}{2}$$
$$\sin(i \ln \varphi) = \frac{i}{2}$$
$$\varphi = 1 + \frac{1}{\varphi}, \quad \varphi = 1 + \frac{1}{1 + \frac{1}{\varphi}}$$
$$\varphi = 1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{\varphi}}} \Rightarrow \varphi = 1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{\varphi}}}$$

$\varphi \approx 1.618$



# The Sun Hive

*“free the bees from a principle at once earthbound and cuboid”*

## Combination of Skep and engineered structures

- *Mounted 8 foot in the air*
- *No movable comb*
- *Professed as a Natural Beekeeping “Biodynamic” way of keeping bees*
  - Honey 'production' is not the main purpose of the hive.
  - Similar Golden Ratio benefits



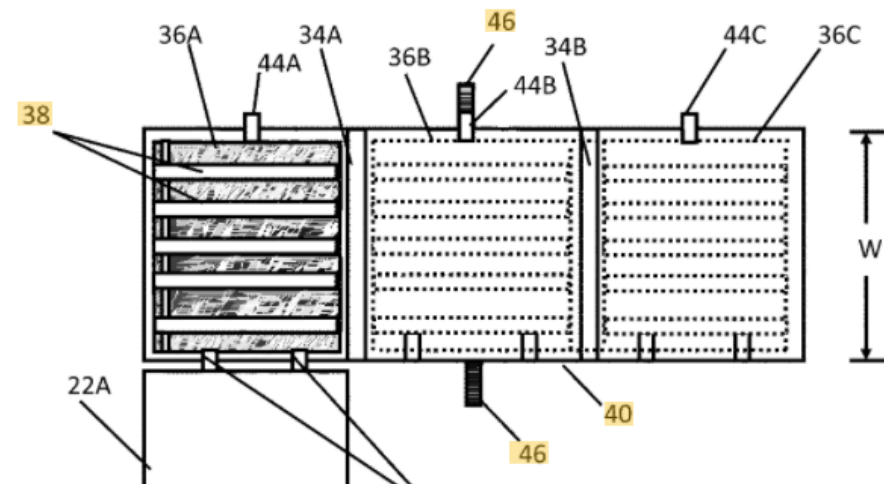


**The Rotating Hive**

# The Rotating Hive

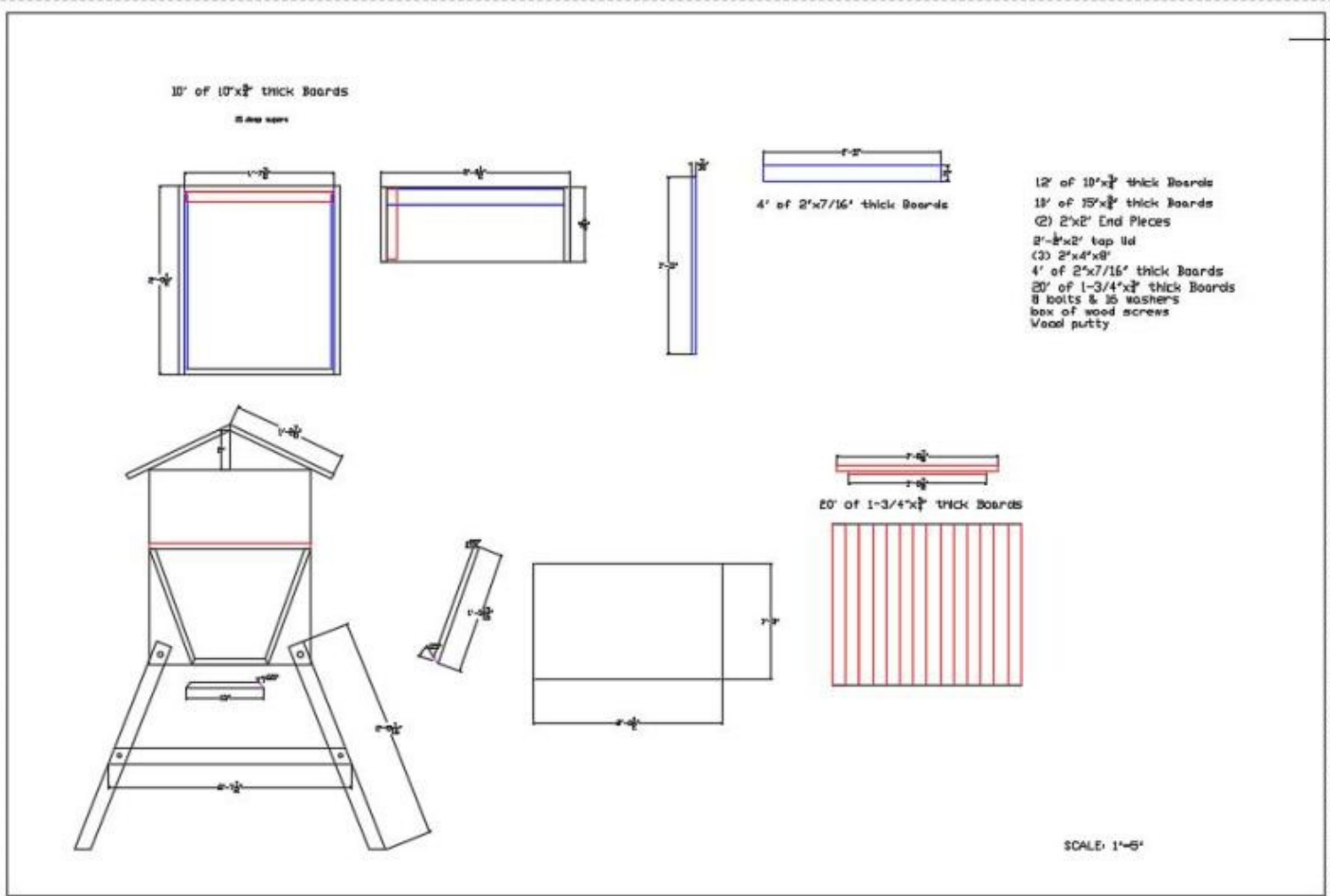
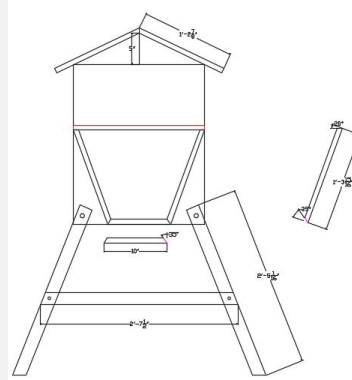
## □ Appalachian Rotatable Hive

- No Heavy Lifting / No Back Pain
  - Easy access for inspection
  - Easy rotation of frames
  - More natural brood area
  - Durability and Honey production





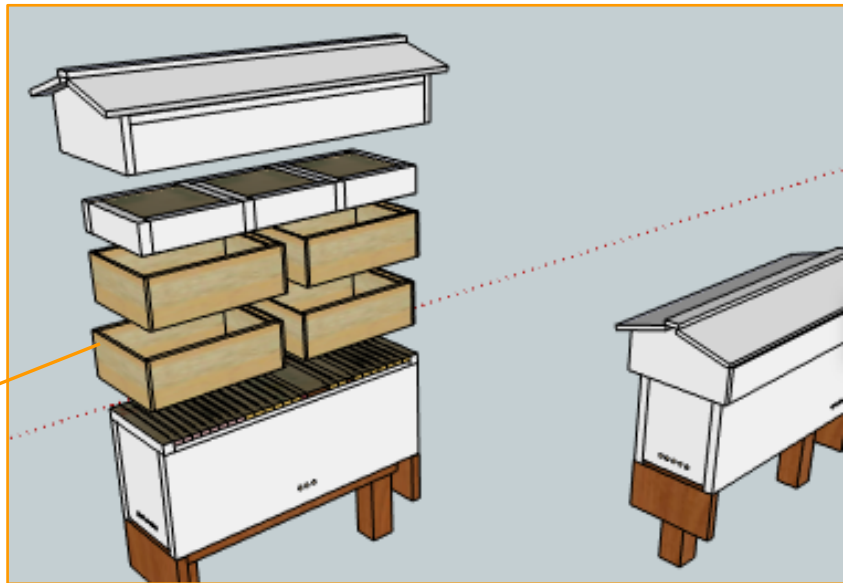
# The "Franken-Hive"



# The “Franken-Hive”

- Can contains up to three colonies >
  - *Can be managed as multi-chamber hive vertically like three Warre hives.*

*This alternative is a two-chamber design*



# The Hex Hive



# The Hex Hive



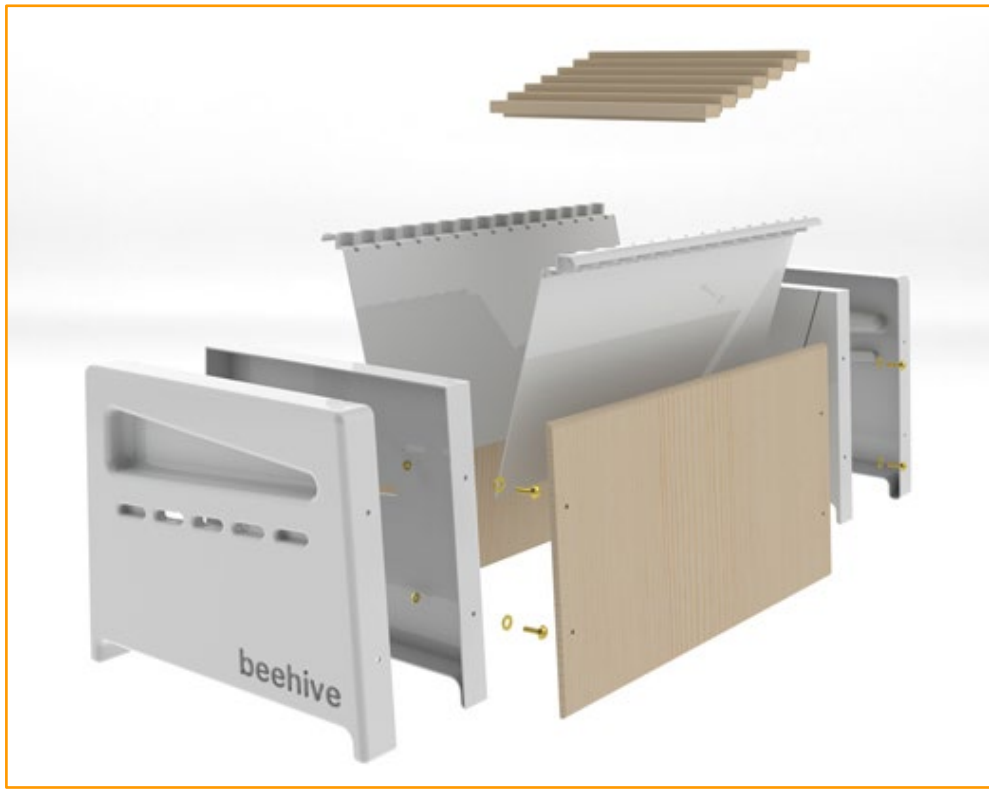
- ❑ Made from cedar that is smooth on the outside and rough on the inside.
- ❑ The 5 middle frames are removable for easy honey harvesting.
  - *The 4 outside frames are intact for the bees to build comb*
  - *They can be left alone or could be removed if needed.*



# Dunford Urban Beehive

## □ The Urban Beehive

- *Concept by New Zealand's Rowan Dunford*
- *Modular for shipping...*





# ▶ The Beehaus from Europe.

## □ Plastic and Metal

- *Insulated design with mesh floor*
- *Accepts supers on top*
- *Many other engineered features*

Conceptually  
Follows  
the historical  
British  
**Dartington**  
Hive design



**Dartington**  
Hive Design



### Outer Lid

This keeps the weather out all year round. It is secured using a strong, elasticated cord.

### Supers

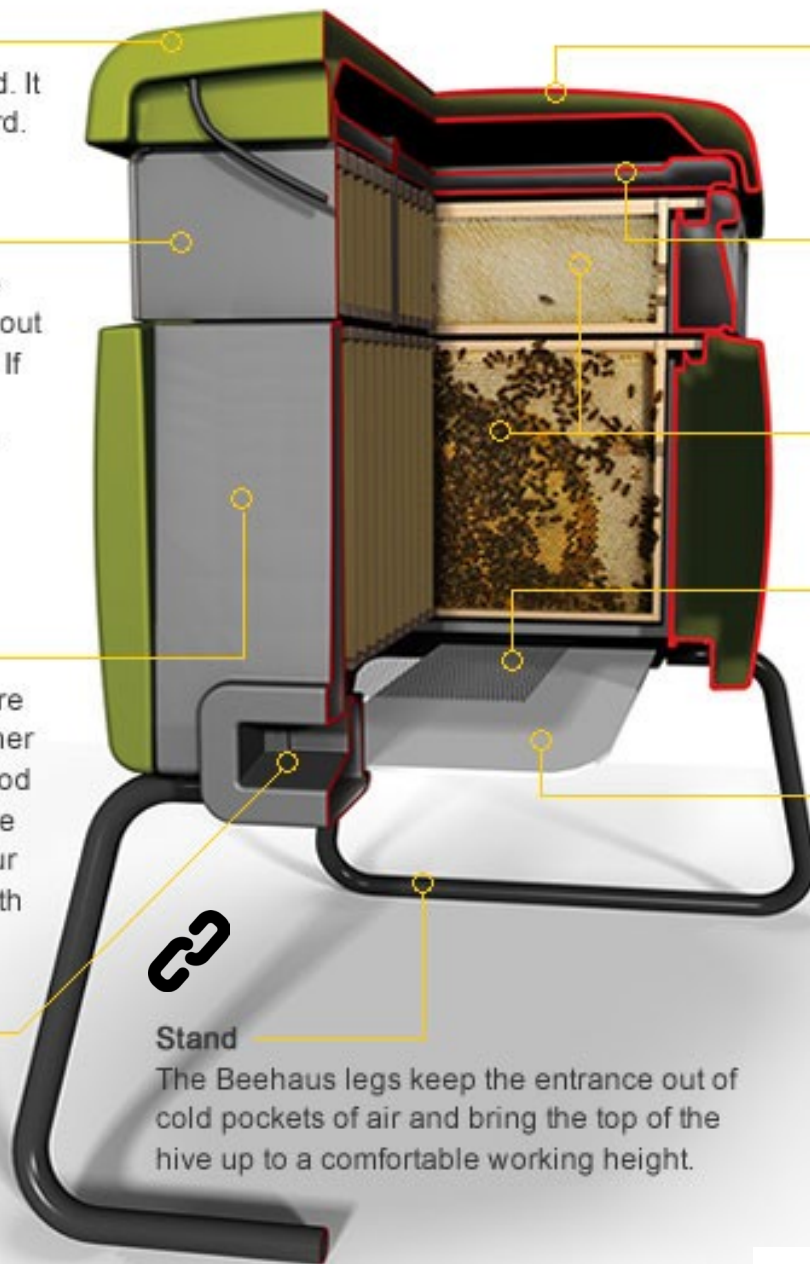
The supers are used by the bees to store honey. A colony will store honey throughout the summer in preparation for the winter. If your bees are successful they will have surplus honey which you can harvest for your family and friends. Your Beehaus comes with 10 super frames with wax foundation sheets

### Brood box

This is the colony's home, the place where the bees live and where the queen lays her eggs. These large frames are called 'brood frames'. When inspecting your bees these are the frames that you look through. Your Beehaus comes with 10 brood frames with wax foundation sheets.

### Entrance

This allows the bees to come and go. The entrance has a large landing board which is sheltered from the wind and rain. Because the Beehaus can be divided and used as two separate hives it has an entrance at either end.



### Insulation

This is really important because bees need to maintain a constant temperature to raise their young.

### Cover board

These sit on top of the brood box or supers and keep the bees in.

### Frames

These hold the wax foundation that the bees build the comb on.

### Mesh floor

The floor is made of mesh. This ensures your bees always have fresh air and it also allows debris and mites to safely fall out.

### Inspection tray

This is located under the mesh floor of the house. It catches any mites or debris that fall from the hive which you can then examine to learn about the health of your bees.

### Sterilisation

You can disinfect the plastic surfaces of the Beehaus against disease using common disinfectants such as bleach.

# The Beehaus

# Tanzanian Long Hive

## ❑ Similar to a Kenyan Top Bar

- *The differentiation is that it employs Straight sides. Traditional Top Bars use sloped sides*
  - This style of top bar often employs frames that have side bars and bottom bars
  - Many have adapted the design of the Tanzanian Long Hive to transform to a **Long Langstroth Hive**

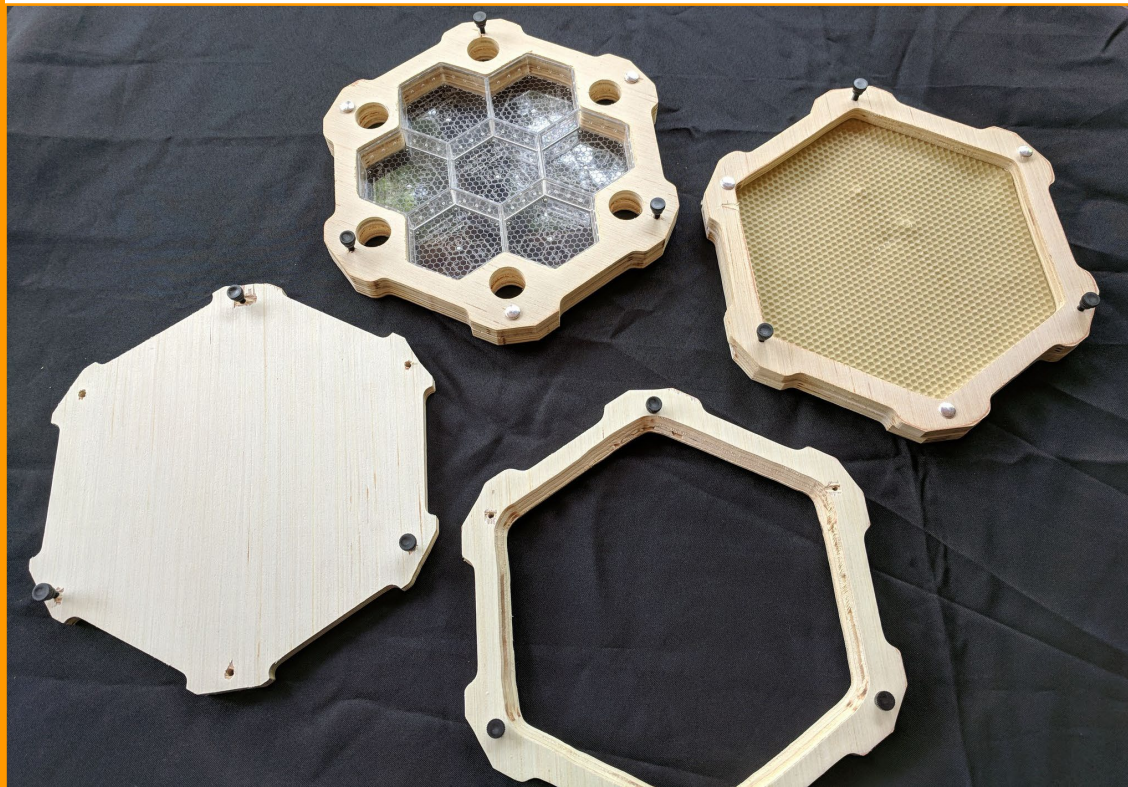
### A TIP TO HELP YOU REMEMBER WHICH IS WHICH

***K-Shaped*** Top Bar (Sloped Sides) = **Kenyan**  
***T-Shaped*** Top Bar (Straight Sides) = **Tanzanian**



# HoneyComb Hive

- ❑ Sold from North Carolina
  - *"Machined" & Engineered approach to hive construction*
    - Similar in some ways to a **Cathedral Hive**



# Cork Hives

## □ Cork Interior or Lining

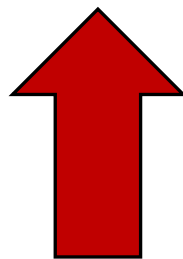
- *Insulative properties, mimicking nature.*
- *Lined with Thermacork*
- *Insulation equivalent to a 4-5" tree*
  - Some designs have cork right in with the bees
  - Others have cork lined with a wood interior

[corkhives.com](http://corkhives.com)

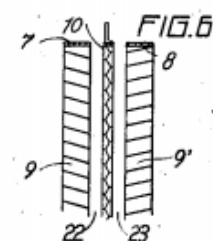
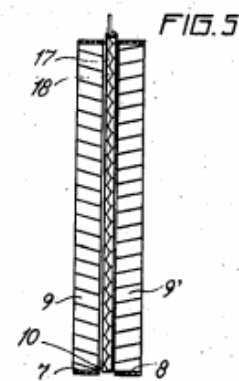
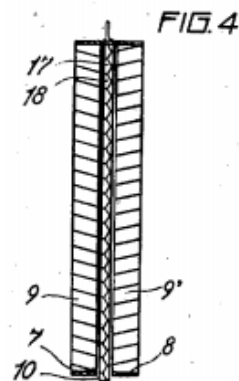
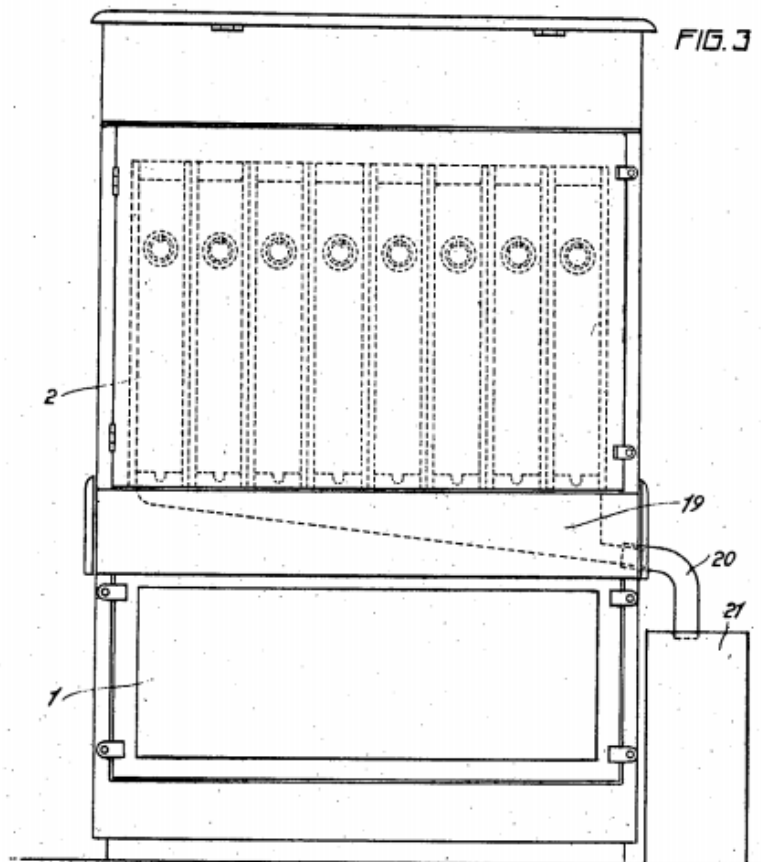
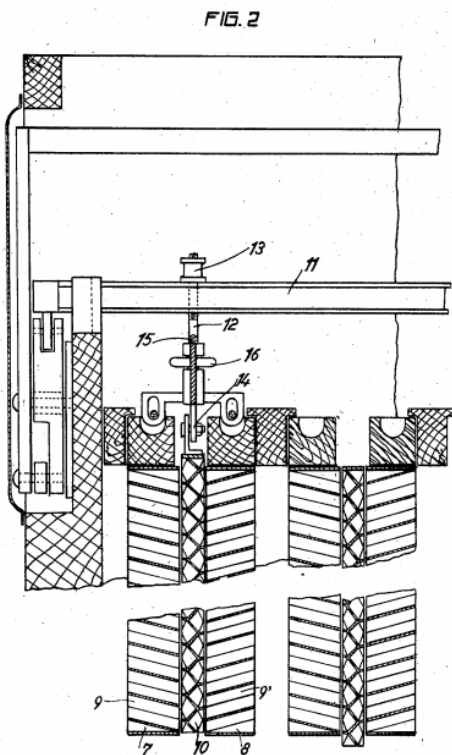
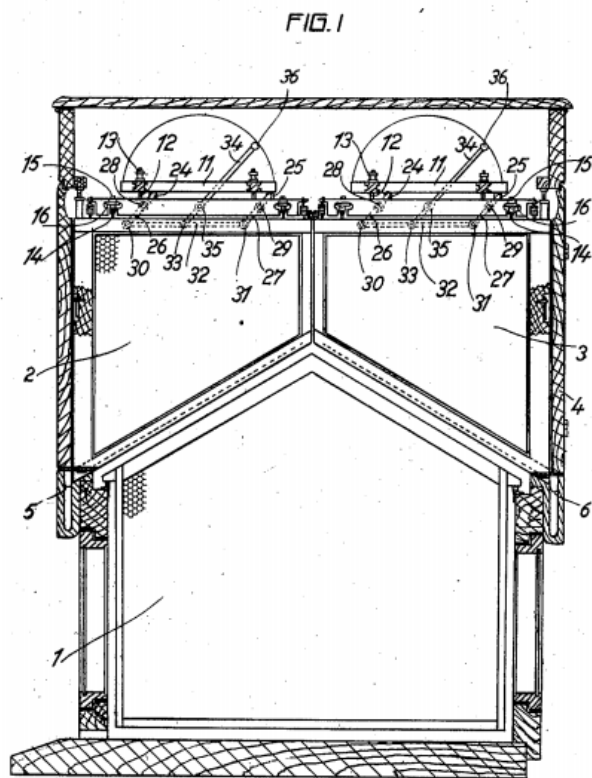


LAST ONE...

# Garriga Hive – Dec 1940



## Look Familiar ?



Inventor  
*J. B. Garriga*  
by  
*W. S. Swans*  
Attorney.

# HIVES IN PRACTICE

Envisioned and, in the Marketplace  
Hives in use around the world: What, where, and why...

# National Hive

## 2019- London

### □ Hive Details

- *Made from 1-inch (2.54cm) Thick Wood Panels*
- *Box Dimension is 18 1/8" (46cm) Square X 8.5" 22.5 cm Deep*
- *Widely spaced – 10 or 12 frames*
- *"Regular" National frames are 14" x 8.5" (35.5 x 22.5cm)*





# National Hive

## 2019- London

### □ Hive Details

- *Since the box is square, they can run the frames the "COLD" or "WARM" way*
  - This means that they can place the frames with the end bars facing the entrance (COLD WAY)
  - Or they can be placed so that the face of the first frame can face the hive – which means air blowing in hits that face, but all the others are protected (aka. The WARM WAY)
- *They can accommodate 10 to 12 frames depending upon the kit*
  - Most typically run them with 11



# United Kingdom Hive Variations

## Understanding the form factors

<p><b><u>NATIONAL</u></b> <b><u>HIVE</u></b></p> <p><b>HIVE BODY</b> 18 1/8" x 18 1/8" 46.0 CM x 46.0 CM</p> <p><b>11 FRAMES</b> 14" x 8 1/2" 35.5 CM x 21.6 CM</p> <p><b>225 MM DEEP</b> <b>149 MM SUPER</b></p>	<p><b><u>DEEP</u></b> <b><u>NATIONAL</u></b></p> <p><b>HIVE BODY</b> 18 5/16" x 18 5/16" 46.5 CM x 46.5 CM</p> <p><b>11 FRAMES</b> 16" x 10" 40.6 CM x 25.4 CM</p> <p><b>315 MM DEEP</b> <b>149 MM SUPER</b></p>	<p><b><u>COMMERCIAL</u></b> <b><u>HIVE</u></b></p> <p><b>HIVE BODY</b> 18 1/8" x 18 1/8" 46.0 CM x 46.0 CM</p> <p><b>11 FRAMES</b> 14" x 12" 35.5 CM x 30.5 CM</p> <p><b>267 MM DEEP</b> <b>162 MM SUPER</b></p>	<p>Not SQUARE</p> <p><b><u>DADANT</u></b> <b><u>JUMBO</u></b></p> <p><b>HIVE BODY</b> 20" x 16 1/4" 50.8 CM x 41.2 CM</p> <p><b>11 FRAMES</b> 17" x 11 1/4" 43.1 CM x 28.5 CM</p> <p><b>299 MM DEEP</b> <b>168 MM SUPER</b></p>
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COMPARED TO THE NATIONAL HIVE 

The frames are both deeper and longer

The frames same length, but deeper

The frames are both deeper and longer

# Rose Hive

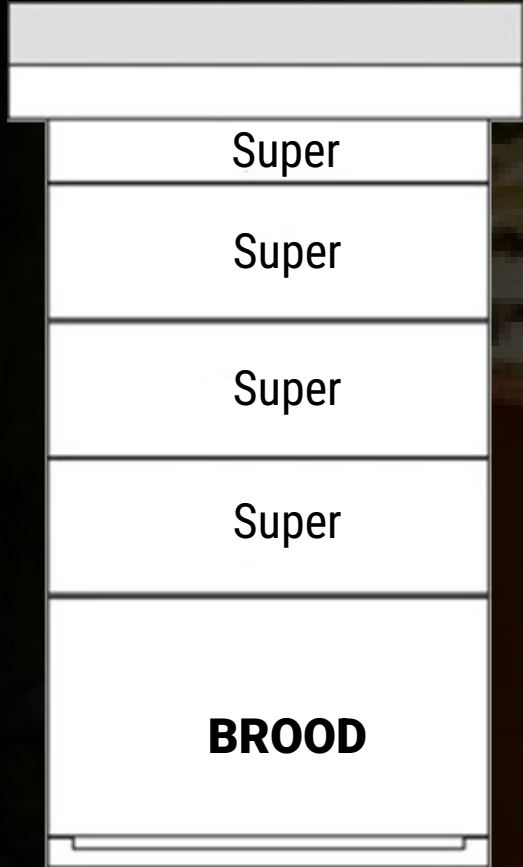
## □ Irish Beekeeper, Tim Rowe,

- *Standardized a 'European' style hive to single sized boxes*
- *Same dimension as a British National hive for the box, but the frame is shorter*
  - 11-inches vs. conventional 12-inches for national

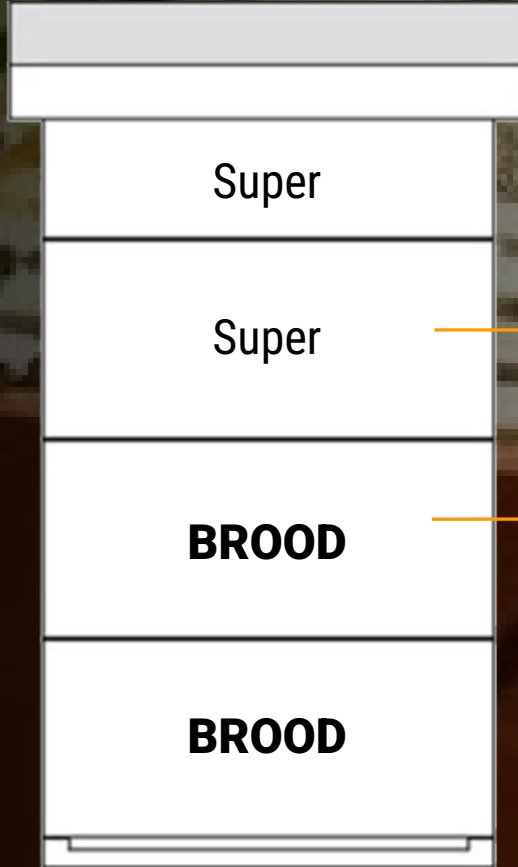


# Rose Hive

The hive was originally marketed as the Rose **One Size Box** (OSB)



**BRITISH NATIONAL**



**ROSE HIVE**

*Kind of like the  
US centric all  
medium  
approach*

*All of the hive  
bodies and  
frames are  
universal*

## **ROSE HIVE**

**HIVE BODY**  
**18 1/8" x 18 1/8"**  
46.0 CM x 46.0 CM

**10 to 12 FRAMES**  
16.9" x 7 1/4"  
43.1 CM x 18.3 CM

**183 MM DEEP**

# Slovenian Style Hives



# Slovenian Hive

## ❑ Worked from Behind

- *Bees exit out the front*
  - You pull the back screen off for each compartment as you go
- *The frames slide out like "CARTRIDGES"*
- *Hives can be deployed as individual units, or in stacks like the Slovenian House*



# Beewise Bee Home

## Earth's first robotic beehive

BEEHOME IS A DEVICE THAT HOUSES 24 COLONIES, ALLOWING BEEKEEPERS TO REMOTELY TREAT THEIR HIVES AND CARE FOR THEIR BEES



# HIVES AROUND *the* WORLD

My Journey Abroad, and the Hive and People Encountered



# Dadant Blatt

## 2016 - Italy



### □ Talking Points

- *One of Several Dadant Variants*
- *The box is 2+ Inches Deeper than a Langstroth*
- *Features a shorter top bar than a Langstroth*
- *Can have 10 to 12 frames*
  - 11 Frames seemed conventional
- *In Practice:*
  - One 'deep' for the nest with Multiple honey supers placed on top



The story of Giancarlo > 22:00 episode 98

# Dadant Blatt

## Features

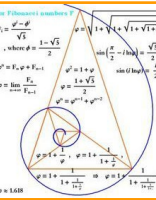
- ❑ 1 Thick Wood Boxes
- ❑ 2 Luggage Handles
- ❑ 3 Front Porch
- ❑ 4 Front Porch Pollen Trap



# Cathedral Hive

## □ Hexagonal Hive

- *An evolution of the top bar hive*
- *Promoted from a 'natural beekeeping' approach.*
- *Another golden mean design*



# WBC Hive

2019 - London

## □ Talking Points

*Wide spacing;*

*A hive "in a shell"*

- *Considered Boutique, Fussy, Hard to use, and Expensive.*
- *Now most use national hives.*



# WBC Hive

## 2019 - London

### □ Talking Points

- *Telescopic Design:*

- Originally double wall; now it is in essence an interior with a shell
- Insulation and shedding water is the catalyst for the design
- It is an 8-Frame Hive





**Top Bar**  
**2018 - Malawi**



## ❑ Talking Points

- *Very crude, low quality wood*
- *Hung from 'greased' wires*

**Top Bar**  
2018 - Malawi

# Langstroth

2019 - *South Africa*





# Langstroth

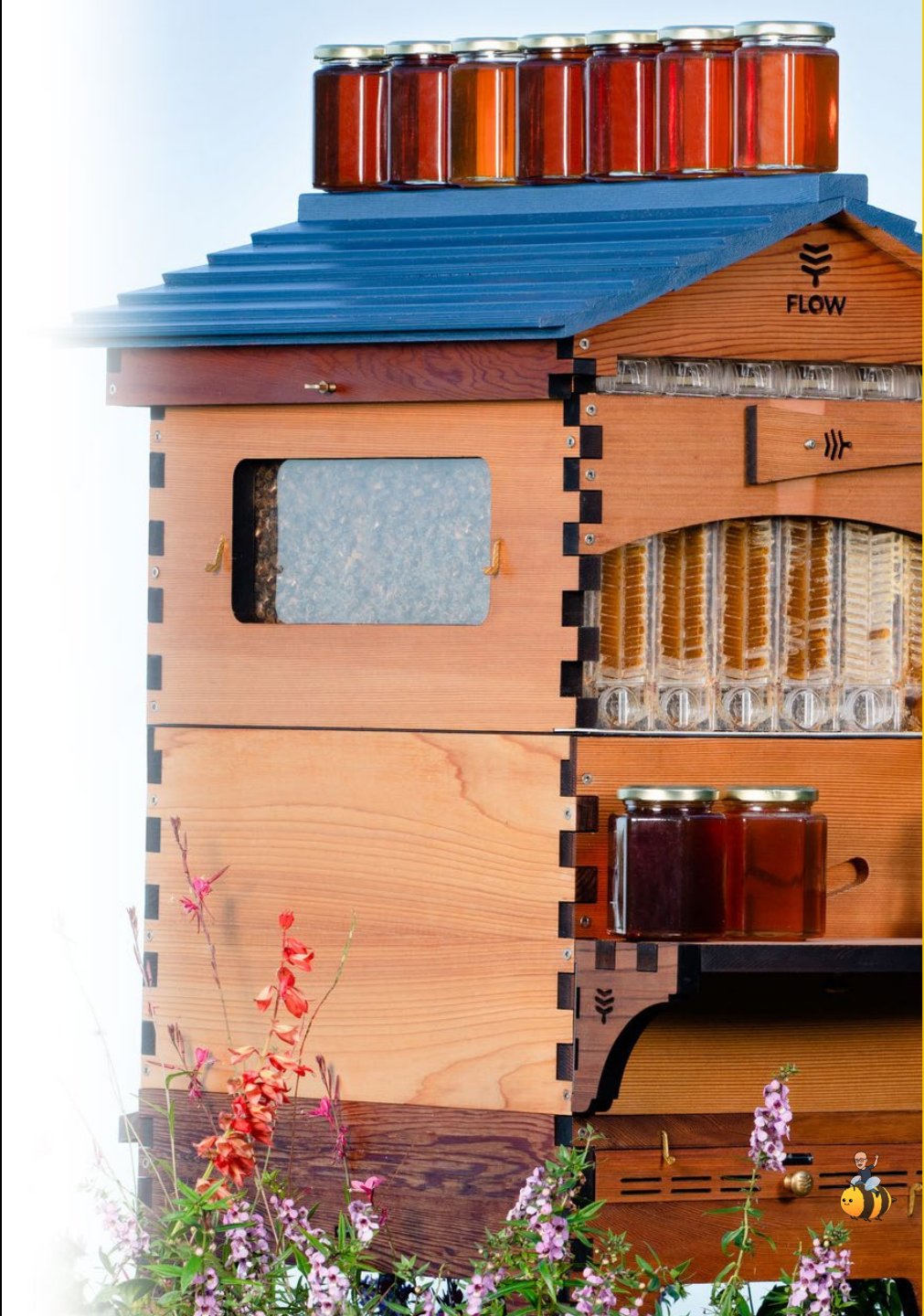
2019 - *South Africa*





# HIVES AT HOME

My Direct Experience with Different Hive Form Factors



**The Flow Hive**  
deployed 2018 – [My Apiary](#)



# The Flow Hive

deployed 2018 – **My Apiary**

## □ Talking Points

- *Incredible engineering; beautiful*
- *Hit and Miss on building out. Requires super strong colony*
- *Stewart Anderson (the Inventor) helped me solve my issues*



# The Flow Hive

deployed 2018 – **My Apiary**

## □ Talking Points

- *Incredible engineering, beautiful*
- *Hit and Miss on building out. Requires super strong colony*
- *Stewart Anders (the inventor) helped me solve my issues*
- ***Last Year I had that Magical Moment***





# BeeBox Poly Hive

deployed 2016 – **My Apiary**





# BeeBox Poly Hive

deployed 2016 – **My Apiary**

❑ Real World.....

❑ Talking Points



- *Great in winter & summer*
- *Prolific hive (ever year!)*
- *Regular wood boxes can go on top*
- *Some fussiness with glue, fixed...*
- *Space above frames little too small*
- *Obviously, no need to insulate in winter*



# BeeBox Poly Hive

deployed 2016 – **My Apiary**

## ❑ Developed in Finland.

- *Compact, Harder, High Density Polystyrene in a Langstroth form factor.*
  - 8X more insulation than wood hives
  - Resistant to mold, Impervious to Rot
- *Many vendors are now getting into producing polystyrene hives*



# Six and Eight Frame Poly Hive Versions

deployed 2019 & 2020– **My Apiary**

## □ Talking Points

- *Great utility in these both of these form factors*
- *6-Frames come with a design for a center divider*
  - They can be used for two 3-Frame Queen Castles
  - They have entrances front and back
- *8-Frame holds (9) frames*



***By the way...***  
**Did you spot  
the Owl?**



**6-Frame Poly Nuc**

# Nuc Layens Hive

deployed 2019 – My Apiary





# Layens Hive

2020 – **My Apiary**

## □ Talking Points

- *Hive commonly used in Spain*
- *Leo Sharashkin promotes these*
- *20 frames, 13" x 16" frames typical*



# Warre Hive

deployed 2016 - **My Apiary**



## □ Talking Points

- *Pleasurable Hive but not very successful in overwintering*
- *It is smaller than it looks. It occupies a small footprint and the boxes are small in comparison to a Langstroth*
- *No extraction capabilities*
- *Requires some expertise Including Nadir Concepts*





# The “Garden” Hive

deployed 2018 – **My Apiary**

## □ Talking Points

- *Cute little hive – not too dissimilar in many of operation to my Warre hive*
- *I have used the individual boxes as queen mating devices*
  - I provided them with an individual temporary roof and floor
- *Lost it one year to carpenter ants*



# Lang. Top Bar Hive

2016 - **My Apiary**



## □ Talking Points

- *Custom Design – Kenya Style Top Bar with Langstroth Dimensions.*
- *The goal from the start was to be able to put Langstroth Supers over top.*

**2016 Version**



# Lang. Top Bar Hive

2016 - **My Apiary**



- *Tried in the large format for three seasons with no success. Bigger was not better.*
- **Cut the hive down by one-third.**  
*From that time on the hive has been in service*

**2016 Version**



**2020 Version**





## Lang. Top Bar Hive 2016 - My Apiary

- Utilizes Langstroth Foundationless Style Top Bars – Bees can pass through
- Takes conventional Langstroth Supers over the brood chamber

# ARE YOU ALTERNATIVE?

Is this interesting. If so, some tips to follow for experimentation

# Are you alternative?

## □ Tips

- *For different, but known hives, do some research first.*
- *Think of all the angles,*
  - Extra non-conforming equipment, extracting, expansion, robbing guards, hive stands, feeders, and all of the other one-off things you should think through
- *Be willing to go it on your own. Maybe there's a community...*
- *Follow the basics – mind bee space and cavity size*
- *If it is too good to be true, it probably is*

# EMAIL

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# WEBSITE

[www.bkcorner.org](http://www.bkcorner.org)

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available to download.

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presentations or click the  
presentations link



# QUESTIONS