

# Modular evolution

Creative toy & game figure -prototype  
J. Rantanen

# A game based on evolution

- modules → play → creativity
- funny
- playable together or alone
- entertainment and education purposes
- create speculative fiction, understand the laws of nature

Simple or Complex?  
research & visualize  
evolution trees

# Prototyping idea

- Evolution of animals
  - breaking down physiology
  - simplify for prototype
- Background
  - modular toys and figurines such as legos, magnets
- Prototyping
  - 3D printing with Formlabs (fine detail)
  - testing modularity



## References

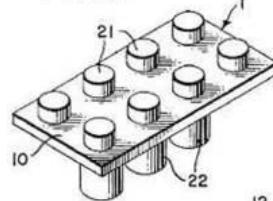
Oct. 24, 1961

G. K. CHRISTIANSEN  
TOY BUILDING BRICK

3,005,282

Filed July 28, 1958

FIG. 1.



2 Sheets-Sheet 1

FIG. 2.

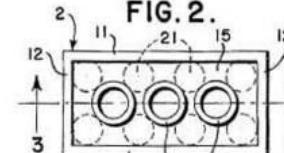


FIG. 3.

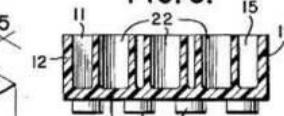


FIG. 4.

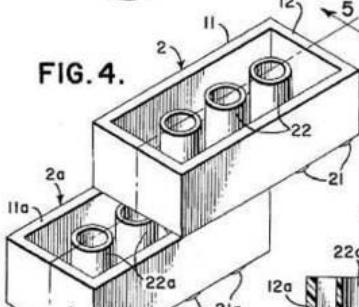


FIG. 5.

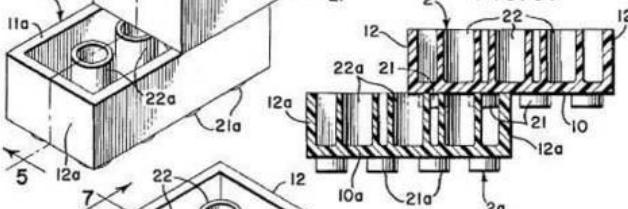
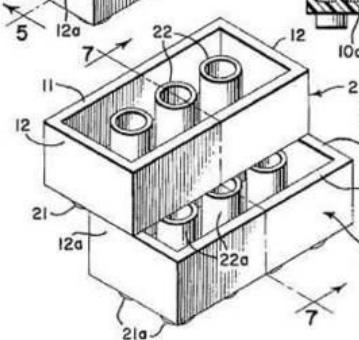


FIG. 6.



INVENTOR

Godtfred Kirk Christiansen

BY Stevens, Davis, Miller & Moskau  
ATTORNEYS

Design by Max Knecht, product of Knock Knock.

← Old lego designs.



Monster totem pole by OopisNein (picture from Etsy.)

# First prototype

Interlocking blocks:

- + intuitive
- + formlabs easy to use
- + fun to play with, even with two parts
- the fit is too tight at first
- Maya doesn't export 3D print quality, or .stl → have to learn rhino



# Second prototype

- 3 modules, with different dimensions
  - f/f, m/m and uni-f
  - m/m -0.03 and -0.05 smaller
- + still fun
- too loose fit!

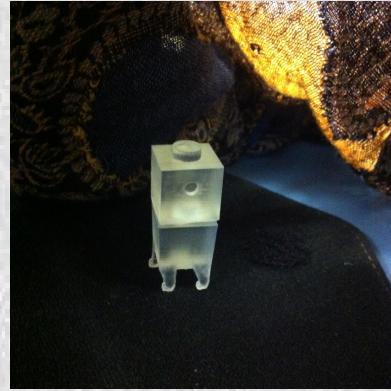


→ -0.02 smaller, next legs and head too

# Third prototype

Tiny quadrupetal x2:

- + cute
  - the horns are too small to handle
  - Animals in Maya → low poly, not the final style (multiple programs cause problems, hard to find the right dimensions)
- maybe silicone or resin casting?



# Fourth prototype

Bigger quadrupetal!

a horse/ a bull

+ legs attach well

- horn and neck dimensions too tight

→ -0.01 or -0.02 smaller male

- (still low poly)



# Lessons learned

- + Formlabs is easy
  - + need to check CAD for better models
  - keep track of the dimensions between prints when using different programs & scale
- ? What is the best 3D modelling program for printing?

# Future

A game or "just toys" -desicion:

- 1 Open source models of toys, downloadable from the website (print by themselves)
- 2 Models can be purchased from the game's website (print by themselves)
- 3 A digital simulation/ game, but actually tangible toys are fun