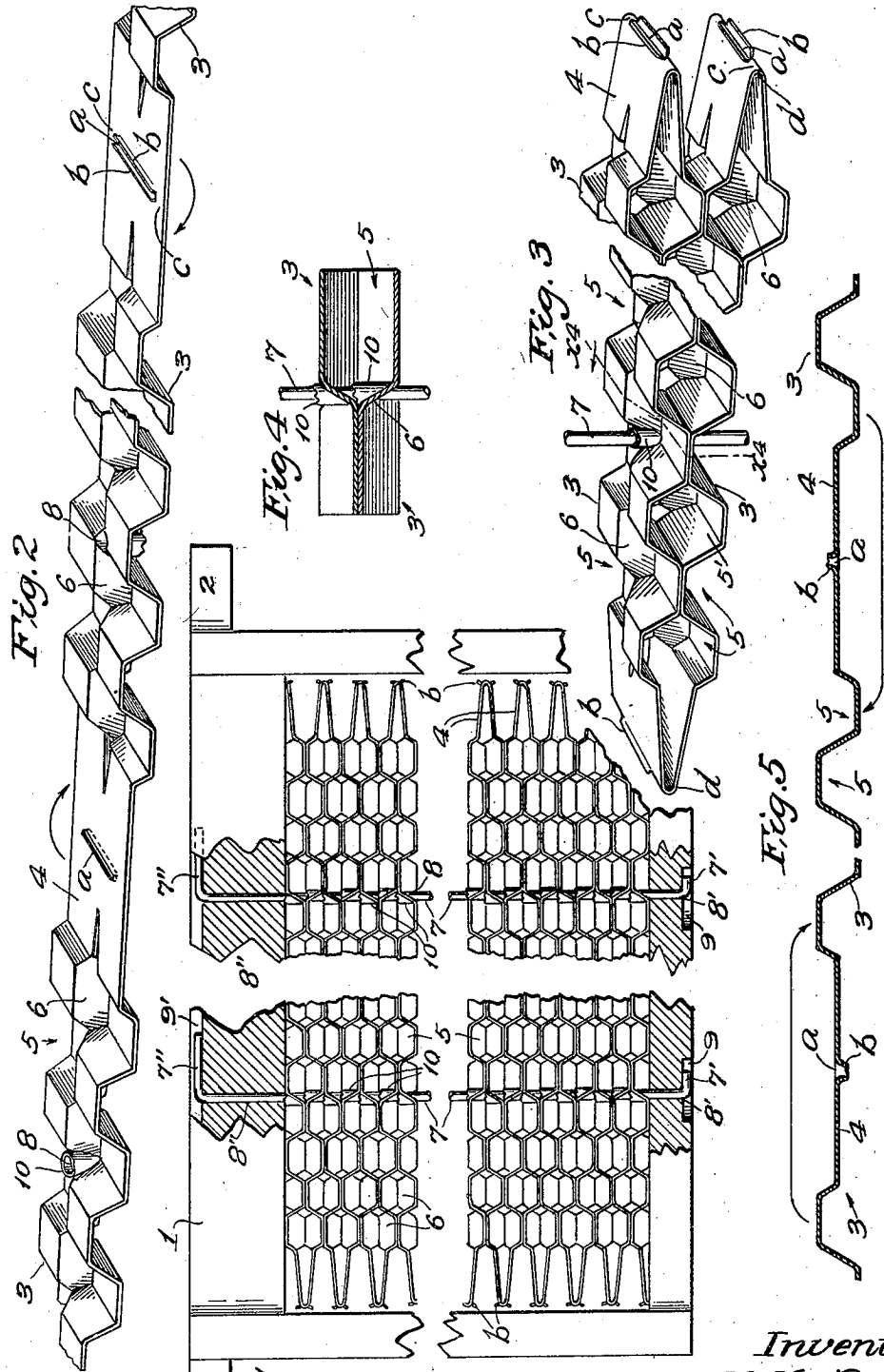


G. M. MacDONALD.
 ARTIFICIAL HONEYCOMB AND THE ART OF AND MEANS FOR MAKING THE SAME.
 APPLICATION FILED JULY 19, 1920.

1,383,650.

Patented July 5, 1921.



Witness
 C. C. Holly

Fig. 1

Inventor
 George M. MacDonald
 James P. Townsend
 his atty.

UNITED STATES PATENT OFFICE.

GEORGE M. MACDONALD, OF SAN BERNARDINO, CALIFORNIA.

ARTIFICIAL HONEYCOMB AND THE ART OF AND MEANS FOR MAKING THE SAME.

1,383,650.

Specification of Letters Patent. Patented July 5, 1921.

Application filed July 19, 1920. Serial No. 397,429.

To all whom it may concern:

Be it known that I, GEORGE M. MACDONALD, a citizen of the United States, residing at San Bernardino, in the county of San Bernardino and State of California, have invented new and useful Improvements in Artificial Honeycombs and the Art of and Means for Making the Same, of which the following is a specification.

This invention relates more particularly to improvements upon and in the art of making the type of honeycomb described in my previous Patent No. 1,224,479, issued May 1, 1917.

This type of honeycomb is composed of a plurality of superimposed thin strips, each being crimped to form a series of transverse grooves alternately arranged upon opposite sides of the strip and extending outwardly from each side of the longitudinal center thereof. Each of these grooves forms a semi-cell which is open at its outer end and practically closed at its inner end and when the strips are super-imposed the semi-cells of one strip register with those of the adjacent strips to form complete cells open at their outer ends and practically closed at their inner ends.

The principal object of this invention is to provide a construction and a method of making the same whereby the various component elements may be most cheaply constructed and quickly, accurately and rigidly assembled. It also provides all of the advantages pointed out in the above mentioned previous patent, viz, an indestructible honeycomb which may be used a great many times, and from which the honey may be easily extracted by centrifugal or other means and which may be easily and thoroughly cleaned and sterilized, which is especially desirable in case it becomes infected, infested or diseased as sometimes happens.

The invention comprises the ribbon, and the combination by which the comb is formed.

The device is further provided with other novel and advantageous features of construction and arrangement as will be hereinafter more fully described and particularly pointed out in the claims.

The ribbon may be of any suitable material adapted to the purpose and which will not be obnoxious or repellant to the bees. At present I make said ribbon of very thin sheet aluminum but I do not limit myself to the use of aluminum or other metal.

Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detail description and the appended claims.

The accompanying drawing illustrates the invention.

Figure 1 is a fragmental side elevation of a honeycomb constructed in accordance with this invention.

Fig. 2 is an enlarged perspective of a portion of the crimped metallic ribbon which forms the cells.

Fig. 3 is an enlarged fragmental perspective of said crimped ribbon bent upon itself to form substantially two superimposed strips, semi-cells of one strip registering with semi-cells of the other to form complete cells.

Fig. 4 is a transverse section on line x^4-x^4 , Fig. 3, showing more particularly the burs and binding rod or wire.

Fig. 5 is a fragmental longitudinal mid-section of a ribbon and comprises parts of three strips before the ribbon is folded.

1 represents the frame, rectangular in shape and preferably made of wood, projecting lugs 2 being provided at its upper end by which it is supported in the bee hive, not shown.

3 represents the metallic strips, a plurality of which being crimped and superimposed and mounted within the frame, form the cells that constitute the honeycomb. The strips, preferably made of very thin sheet aluminum or other suitable material are formed integrally of a continuous ribbon of such material; the strips being joined one to the other, end to end, by flat uncrimped bent portions 4 of the material.

Each strip is crimped to form transverse grooves 5 alternately disposed upon opposite sides of the strip and alternately arranged upon opposite sides of the longitudinal axis thereof. Each groove so formed constitutes a semi-cell, preferably semi-hex-

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Each strip is crimped to form transverse grooves 5 alternately disposed upon opposite sides of the strip and alternately arranged upon opposite sides of the longitudinal axis thereof. Each groove so formed constitutes a semi-cell, preferably semi-hex-

are superimposed upon each other; said strips respectively having grooves that register with similar grooves in adjacent strips to form cells, and means for retaining said strips in closely related superimposed position in said frame.

5 5. An artificial honeycomb comprising a plurality of strips formed integrally end to end of a continuous ribbon of sheet material folded to superimposed positions relative to each other, said strips respectively having grooves to register with similar grooves in adjacent strips to form cells; said strips also having holes located similarly in each strip relative to its ends and grooves, and rods extending through said holes to bind the strips in superimposed relation and to register the grooves.

10 6. An artificial honeycomb comprising a frame, a plurality of strips integrally formed end to end and folded to superimposed positions relative to each other; said strips having grooves to register with similar grooves in adjacent strips to form cells and said strips also having holes located similarly in each strip relative to its ends and grooves; and wires extending through holes in said frame and through the holes in the strips to hold the strips in superimposed relation in the frame and to register the grooves with each other.

15 7. An artificial honeycomb comprising a plurality of strips integrally formed end to end and adapted to be folded at the juncture between their ends to assume superimposed positions relative to each other; said strips having grooves to register with similar grooves in adjacent strips to form cells, and said strips also having holes punched and located similarly in each strip relative to its ends and grooves; the burs formed by punching said holes occurring alternately on opposite sides of each successive strip before the strips are folded, and all extending in one direction when the strips are folded and superimposed; and wires extending through said holes to bind the strips in superimposed relation and to register the grooves with each other.

20 8. An artificial honeycomb comprising a frame, a plurality of elongated strips integrally formed end to end of sheet material and crimped to form transverse grooves alternately disposed upon opposite sides of the strips and alternately extending from opposite sides of the longitudinal center, being open at the edges of the strips and practically closed at the center thereof; said strips also having holes punched and similarly located in each strip relative to its ends and grooves, and the burs formed by punching said holes occurring alternately on opposite sides of each successive strip before the ribbon is folded, and all extending in

one direction after the ribbon is folded and superimposed; there being uncrimped portions at the ends of the strips so that the strips are superimposed on each other and the grooves of said strip register with similar grooves in adjacent strips to form cells; and wires extending through holes in the frame and through the holes in the strips to hold the strips in superimposed relation in the frame and to register the grooves with each other.

75 9. The method set forth of making metallic honeycomb which consists in crimping a metallic ribbon to form a series of semi-cell crimps in pre-determined lengths with blank spaces between said series; then punching the crimped spaces alternately, one series being punched in one direction and the next series in the other direction, so that the burs formed by the punch will be reversely arranged upon the successive strips; then folding the ribbon upon itself to bring the holes into register with each other, with the burs all in one direction, and then inserting wires through said holes in the direction of the burs and securing said strips in a frame by means of said wires.

80 10. A ribbon of material adapted to form an artificial honeycomb crimped to form transverse grooves alternately disposed upon opposite sides to form semi-cells open at the edges of the strips and practically closed at the center of the strips by walls formed of the material of the strips; said ribbon being provided with uncrimped portions with narrow transverse slots to locate bends whereby the strips may be accurately brought together to cause the crimps to register to form complete cells.

85 11. A ribbon of material adapted to form an artificial honeycomb crimped to form transverse grooves alternately disposed upon opposite sides to form semi-cells open at the edges of the strips and practically closed at the center of the strips by walls formed of the material of the strips; said ribbon being provided with uncrimped portions with narrow transverse slots to locate bands whereby the strips may be accurately brought together to cause the crimps to register to form complete cells; said slots being formed with burs which give rigidity to the ribbon so that the ribbon will not be crimped by the operation of bending the same.

90 12. A ribbon crimped to form a honeycomb structure and provided with transverse slots adapted and arranged to facilitate bending the ribbon in the process of forming the honeycomb.

95 13. A ribbon crimped to form a honeycomb structure and provided with transverse slots adapted and arranged to facilitate bending the ribbon in the process of

forming the honeycomb; said slots having burs adapted to prevent crimping of the ribbon during the process of bending.

14. A ribbon crimped to form a honeycomb structure and provided with transverse slots adapted and arranged to facilitate bending the ribbon in the process of forming the honeycomb; said slots having burs extending transversely of the ribbon, upon

that side of said ribbon which will be outside when the ribbon is bent to form the honeycomb.

In testimony whereof I have hereunto set my hand at Los Angeles, California, this 12th day of July, 1920.

GEORGE M. MACDONALD.

Witness:

JAMES R. TOWNSEND.