

No. 662,682.

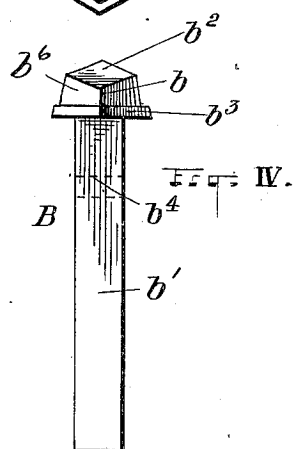
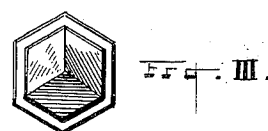
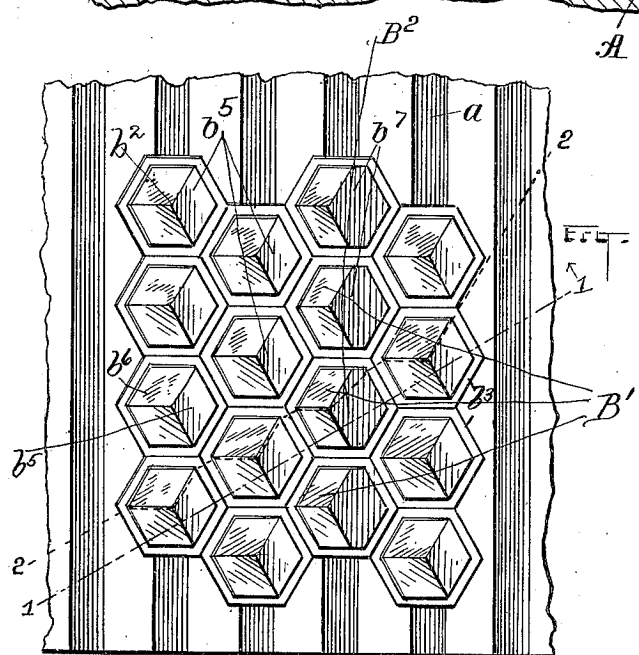
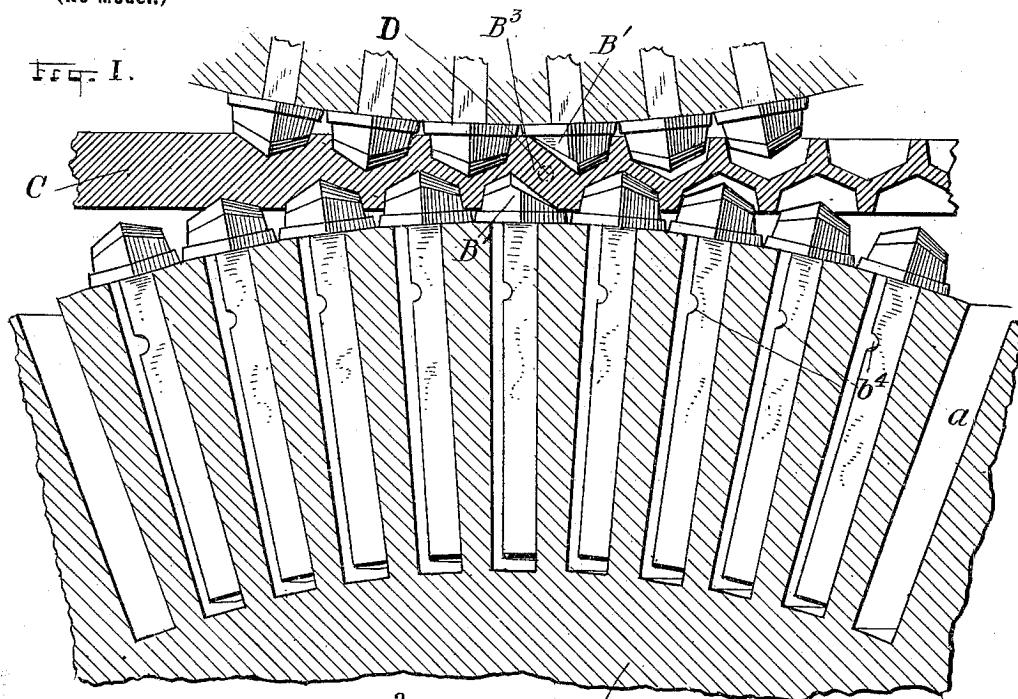
Patented Nov. 27, 1900.

E. B. WEED.

APPARATUS FOR MANUFACTURING HONEYCOMB FOUNDATIONS.

(Application filed Mar. 16, 1898.)

(No Model.)



WITNESSES
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Fig. V.

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UNITED STATES PATENT OFFICE.

EDWARD BEVERLY WEED, OF MEDINA, OHIO, ASSIGNOR TO THE A. I. ROOT COMPANY, OF SAME PLACE.

APPARATUS FOR MANUFACTURING HONEYCOMB-FOUNDATIONS.

SPECIFICATION forming part of Letters Patent No. 662,682, dated November 27, 1900.

Application filed March 16, 1898. Serial No. 674,078. (No model.)

To all whom it may concern:

Be it known that I, EDWARD BEVERLY WEED, a citizen of the United States, and a resident of Medina, county of Medina, and State of Ohio, have invented a new and useful Improvement in Apparatus for the Manufacture of Honeycomb-Foundations, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure I represents an enlarged partial sectional view of two of my improved foundation-rolls when in operative position, said view being taken upon a plane oblique with respect to the axis of the die-support and parallel with rows of cell-dies, said plane being indicated by line 1 1, Fig. II. In said figure the cell-dies are shown in elevation and the foundation is shown between said rolls in vertical cross-section taken upon planes indicated by line 2 2, Fig. II. Fig. II represents a plan view of a portion of one of the rolls, showing a number of cell-dies in position thereon. Fig. III represents a top plan of one cell-die. Fig. IV represents a side elevation of same, and Fig. V represents a side elevation of the head of a die of particular form.

The body portion A for supporting cell-dies of the roll is formed with a series of equidistant continuous grooves *a* of rectangular cross-section traversing the surface of the roll parallel with the axis thereof. In each groove are placed side by side the metal cell-dies B. Each die is formed with a head *b* and a shank *b'*. The head is provided with a working face *b²* of the desired form, in this case shown to be one-quarter the surface of a rhombic dodecahedron, Fig. III. Interposed between the shank and head and at the base of said head is a circumferential flange *b³*, Fig. IV, conforming in outline to the contour (hexagonal) of the working face and having the

surface of its sides inclined to the axis of the die, so that the greatest diameter is on the lower face or at the base of the flange, as shown in Fig. IV. The shank *b'* of each die is of a width substantially equal to that of the grooves, so that the dies may be inserted in said grooves without driving them. Each shank is formed across one face designed for contact with the side or wall of the groove with a transverse groove *b⁴*, Figs. I and IV, and the length of the shank is made somewhat less than the depth of the groove. The dies are inserted side by side in the grooves with the lower outer edges of the flanges of contiguous dies in contact with each other, and the distance from each other of the grooves is such as to permit said edges of the said flanges of dies in different grooves to be in contact, Fig. II. The dies are pressed down, so that the under surface of the head rests upon the surface of the roll-body, such contact being always assured by virtue of the difference between the length of the shank and the depth of the groove. The dies are so inserted that the grooved faces of all the shanks in one roll-groove are on the same side of the latter, so that the shank-grooves aline and form a continuous channel.

The roll-body is preferably made of iron or steel, and after its surface has been covered with dies the whole is dipped in ammonium-chlorid solution, which enters the roll-grooves through the channels formed by the shank-grooves, also beneath the ends of the shanks and under the die-heads between the flanges, from thence spreading to various portions of the shank-surface. The solution, as is well known, forms a so-called "rust," thereby securing each die firmly in place. When worn so as to be unfit for use, the dies may be removed as required and new ones substituted, such removal being made comparatively easy by the above construction and method of securing.

The relative positions of the faces and the sides of the shank of the dies are such as to bring one of the rhombic faces *b²* parallel with the roll-axis, as shown in Fig. II.

At equal intervals in circumferential rows of dies a die B' in each such circumferential row is caused to protrude a less distance from

the roll-body by cutting off the rhombic face b^5 to assume the form illustrated in exaggerated form in Fig. V and lettered b^7 . Similar positions with reference to the axis of the roll are selected for each die B' , whereby said dies form rows B^2 parallel to the roll-axis and to each other, the longer diameters of the original rhombs being in alinement. The two rolls are set so as to register in the proper manner to form cell-bases and also to cause the depressed row b^2 of faces on one roll to form the faces of the same cell-bases opposite the faces formed by said rows B^2 upon the other roll, as shown in Fig. I. The wax sheet C is passed between two rolls and the foundation formed, as illustrated in Fig. I, rows of thick walls B^3 between two opposite cell-base faces being formed, said rows being parallel with the roll-axis and parallel with each other. The variation of the protrusion of the dies being uniform, the variation in thickness of the cell-bases will likewise be uniform.

The lateral faces b^6 of each die-head are preferably made slightly inclined upwardly and inwardly, so as to prevent possible binding on the withdrawal of the die from the cell in emerging from between the rolls.

The thick rows B^3 furnish a bed for embedding a wire D, whose location when placed in position is shown in dotted lines in Fig. I. These wires form a support for the foundations and are sewed through the sides of the honeycomb-box to which the foundation is secured.

Other means of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means covered by any one of the following claims be employed.

I therefore particularly point out and distinctly claim as my invention—

1. A cell-die consisting of a head, shank and flange, said head being of a diameter greater than that of said shank, and said flange interposed between the base of the head and the contiguous end of the shank, substantially as set forth.

2. In a foundation-machine, the combination with a die-support provided with a series of equidistant grooves, of dies, each die having a shank portion and a head portion, said

shank portion having a diameter less than the diameter of said head portion; each die further provided with a flange intermediate of said head and shank portions, the shank portions secured in said grooves and the flanges resting upon the surface of said support, substantially as set forth.

3. In a foundation-machine, the combination with a die-support provided with a series of equidistant grooves, of dies, each die having a shank portion and a head portion, said shank portion having a diameter less than the diameter of said head portion; each die further provided with a flange interposed between the base of said head portion and the contiguous end of the shank portion, and formed with inclined lateral surfaces, that portion of the flange nearest said shank portion being of greatest diameter; the shank portions secured in said grooves and the flanges resting upon the surface of said support with the lower edges of contiguous flanges in contact, substantially as set forth.

4. A honeycomb - foundation roll having cell-dies of varying degrees of protrusion from the roll-body, such variation being uniform, substantially as set forth.

5. A honeycomb - foundation roll having cell-dies of varying degrees of protrusion from the roll-body such variation occurring at definite intervals, substantially as set forth.

6. A honeycomb - foundation roll having cell-dies of varying degrees of protrusion from the roll-body, the cell-dies of equal amount of protrusion being arranged in rows, substantially as set forth.

7. A honeycomb - foundation roll having cell-dies of varying degrees of protrusion, the cell-dies of equal amount of protrusion being arranged in parallel rows, substantially as set forth.

8. A honeycomb - foundation roll having cell-dies, certain dies having one of their respective faces cut away whereby a thicker wall is formed in the corresponding comb-foundation, substantially as set forth.

Signed by me this 24th day of February, 1898.

EDWARD BEVERLY WEED.

Attest:

A. E. MERTEL,
D. T. DAVIS.