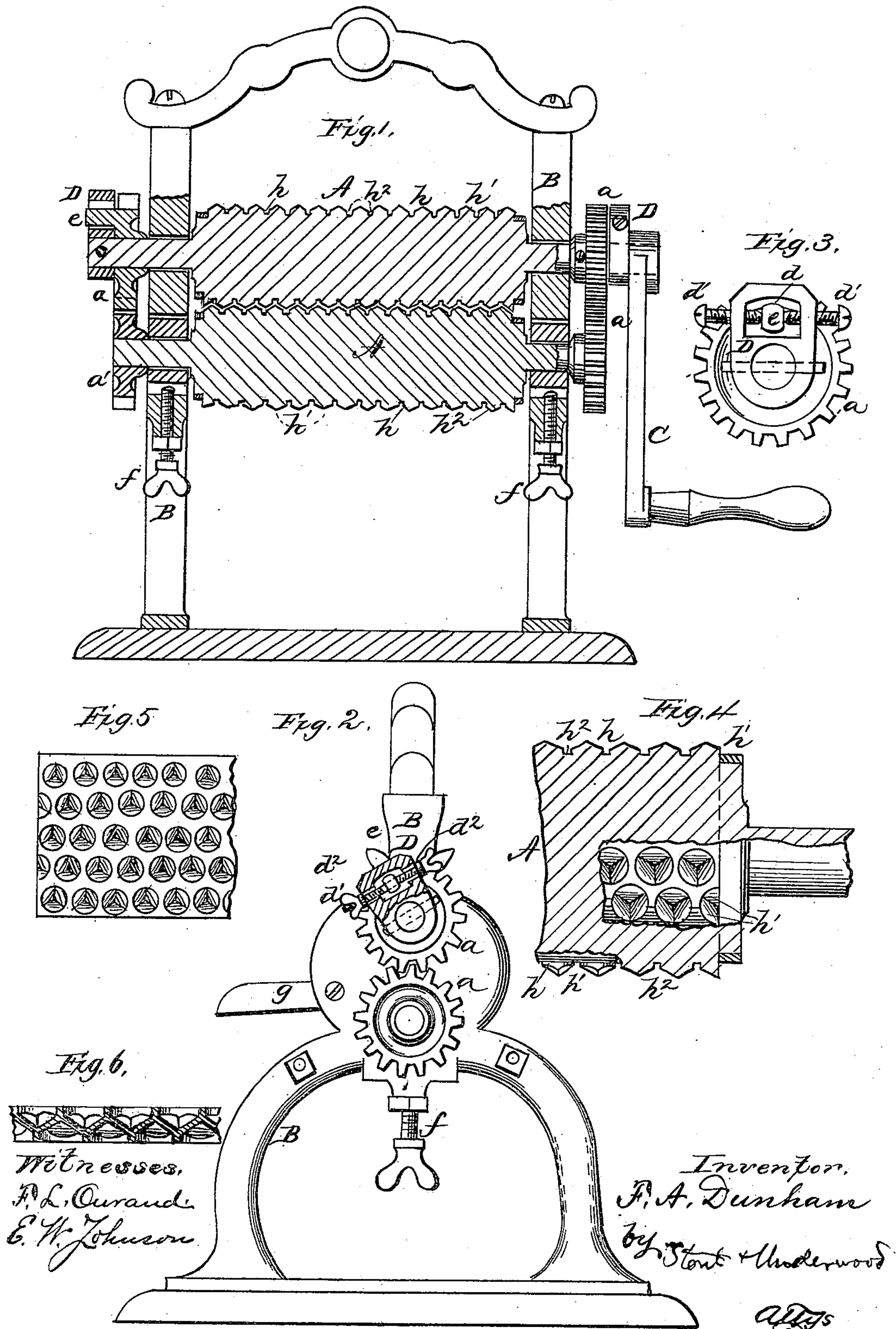


F. A. DUNHAM.
MACHINE FOR MANUFACTURING HONEY COMB FOUNDATIONS.
No. 246,099. Patented Aug. 23, 1881.



UNITED STATES PATENT OFFICE.

FRANCES A. DUNHAM, OF DE PERE, WISCONSIN.

MACHINE FOR MANUFACTURING HONEY-COMB FOUNDATIONS.

SPECIFICATION forming part of Letters Patent No. 246,099, dated August 23, 1881.

Application filed October 4, 1879.

To all whom it may concern:

Be it known that I, FRANCES A. DUNHAM, of De Pere, in the county of Brown and State of Wisconsin, have invented certain new and useful Improvements in Machines for Manufacturing Foundation for Honey-Comb; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to the production of an improved foundation for honey-combs, and will be fully described hereinafter.

Figure 1 is a side view of my improved foundation-machine. Fig. 2 is an end view. Fig. 3 is a detail view of the roll-adjusting mechanism. Fig. 4 is an enlarged detail section, showing the form of dies on the rolls; and Fig. 5 is a plan view of the product, of which Fig. 6 is a detail section.

A A' are rolls, which are journaled in a frame, B. Roll A is provided with pinions *a a*, which are cast or otherwise provided with lugs *e* and a binding-screw for tightening them on the journal of the roll. The lugs *e* extend into openings *d* in blocks D, which are keyed to the journals, to be controlled by turn-buckles *d'*, Fig. 2, or set-screws, Fig. 3, so that after the tightening-screws have been loosened the pinions *a a* may be adjusted on the journals, to cause them to mesh properly with the pinions *a' a'* of the roll A'. The surfaces of rolls A A' have raised upon them a series of dies, the bases of which are cylindrical and their apices triangular or three-sided. The roll A' turns in sliding bearings, which are vertically adjustable by means of lifting-screws *f*, by which the thickness of the foundation is determined. These rolls may be of any suitable material.

The material for the foundation (beeswax) is fed between the rolls from an apron, *g*, and as it passes through, the apices *h'* of the roll A force it (the wax) into spaces *h²* about the bases *h* of the roll A', and vice versa, so that the result is a sheet of beeswax impressed with a series of cells having cylindrical walls and three-

sided or triangular bottoms, those on one side breaking joints with the bottoms of the cells on the other, and the tops of the walls of the cells lying in one and the same horizontal plane at right angles to the sides of the cells.

I am aware that honey-comb foundations have been made with a series of hexagonal cells raised upon a flat surface; also, that a backing has been made up of triangular indentations and projections, a slight undulating line of wax indicating the walls; but the first-named is objectionable in that the flat base, to form a perfect cell, has to be entirely worked over, or if finished out without such work forms a cell of unnatural shape, and the last-named affords no hold for the bees to commence work upon. They therefore refuse to make use of it unless a great number cluster together to produce warmth enough to soften the wax, and perhaps for encouragement to commence work on so large and smooth a surface.

I am also aware that round cells have been vaguely mentioned in connection with indented foundations, but without reference to the tops of the wall rising to one and the same plane at right angles to the sides of the cells.

To place wax enough to form an entire comb in the base of it would be folly, for it would only add to the work of the bees, as it would all have to be removed from the base and placed in the walls. Therefore but little wax can be given them in the base, and the bees themselves have to secrete wax enough to form the walls. It is an established fact that about twenty (some claim twenty-five) pounds of honey is consumed for the production of one pound of wax, for wax is a secretion, the bees lying idle in clusters while secreting it, which they only do while honey is coming into the hive abundantly.

It may not be known that the main harvest of white honey is gathered from clover and linden or bass wood. Clover yields plentifully for two weeks, then bass-wood follows and yields for about ten days. It is therefore a serious matter for the bees to be idle in the midst of the white-honey yield. Buckwheat and dark honey come late in the summer, after the great need of comb-building is over.

An excellent yield of honey is from thirty

to fifty pounds per hive. From fifty to one hundred and fifty is an unusual amount. The enforced idleness may therefore cost almost the entire crop of surplus honey.

5 The base of my foundation requiring very little thinning, the queen will immediately deposit eggs and the work of feeding the larvæ and lengthening up the walls of the cells goes on together without interfering in anyway with
10 the gathering of the main honey-crop; and, also, the combs are built out without generating so great heat in the hive that the bees are forced into swarming, which is considered in these days a great loss, as bees are divided
15 artificially when increase of colonies is desired; and since the walls of the cells in my foundation rise to a uniform height, to one and the same plane, there are no weak points in it. It will therefore support any reasonable weight.
20 Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for making honey-comb foundation, the combination of rolls A A', having dies raised upon them, with pinions *a*, having lugs *e*, setting-block D, screws *d'* and pinions *a'*, as and for the purpose set forth. 25

2. As a new article of manufacture, the honey-comb foundation described, composed entirely of wax, and having cylindrical cells, the tops of the walls of which lie in one and the same horizontal plane at right angles to the sides of the cells, and having triangular bottoms, as and for the purpose set forth. 30

In testimony that I claim the foregoing I have hereunto set my hand and seal this 16th day of September, 1879. 35

FRANCES A. DUNHAM. [L. S.]

Witnesses:

GEO. F. MERRILL,
JOHN SMITH.