

No. 892,428.

PATENTED JULY 7, 1908.

H. H. HUNGERFORD.  
WAFER CUTTING MACHINE.

APPLICATION FILED AUG. 22, 1903.

3 SHEETS—SHEET 1.

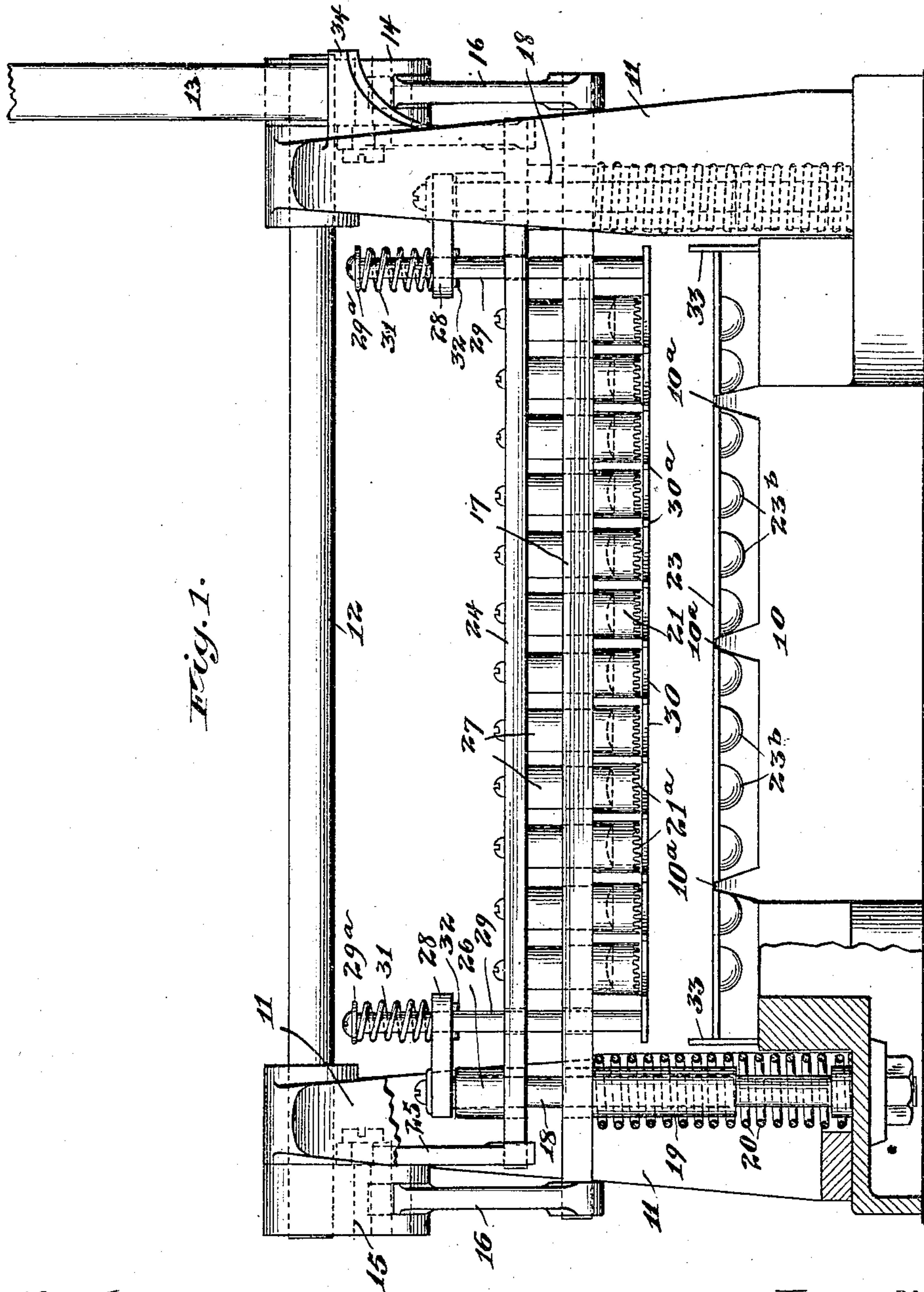


Fig. 1.

Witnesses,  
J. D. Mann,  
A. N. Graves

Inventor,  
Henry H. Hungerford,  
By *Offield Fowler Hutchinson*,  
Att'y.

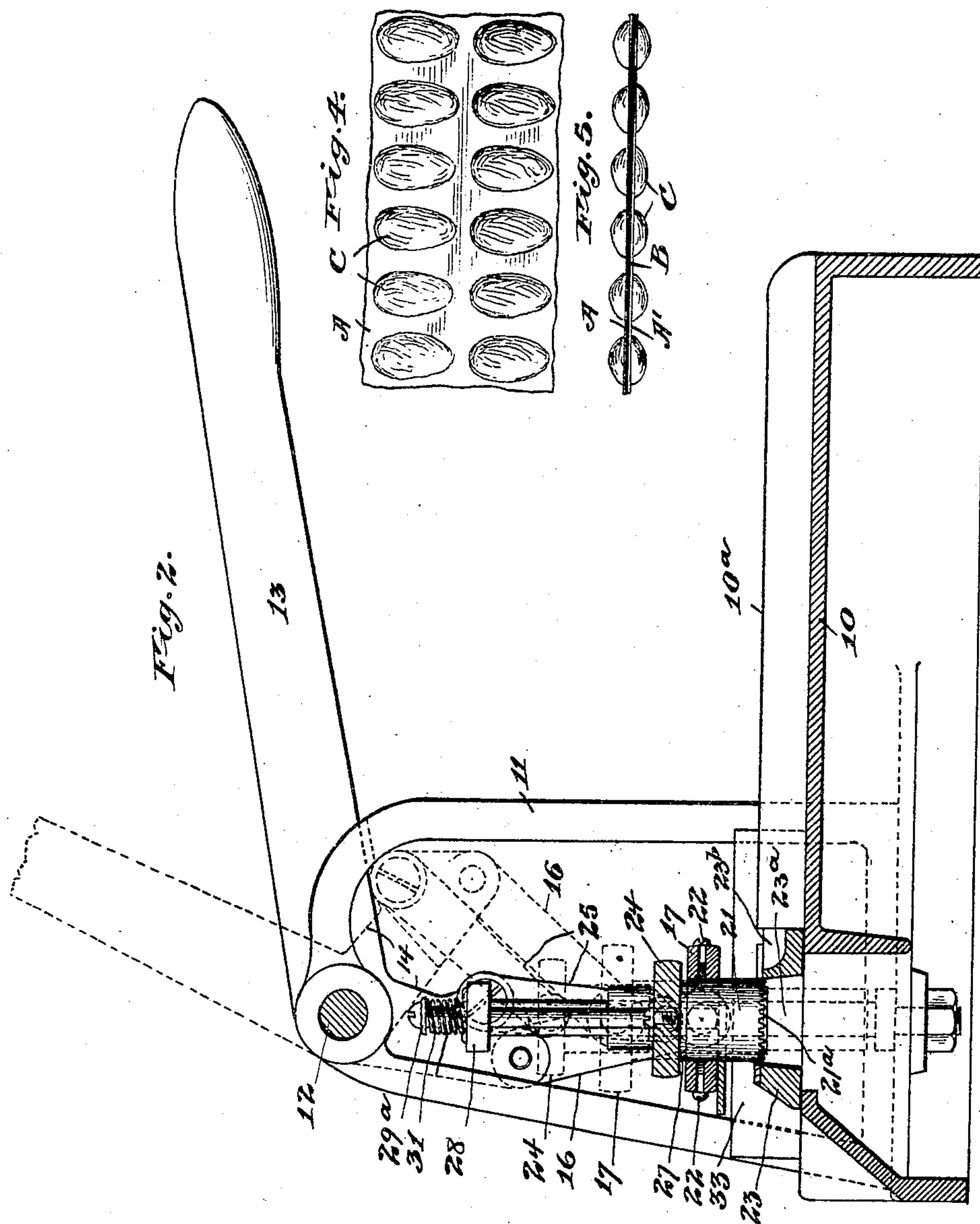
No. 892,428.

PATENTED JULY 7, 1908.

**H. H. HUNGERFORD.**  
**WAFER CUTTING MACHINE.**

APPLICATION FILED AUG. 22, 1903.

3 SHEETS—SHEET 2.



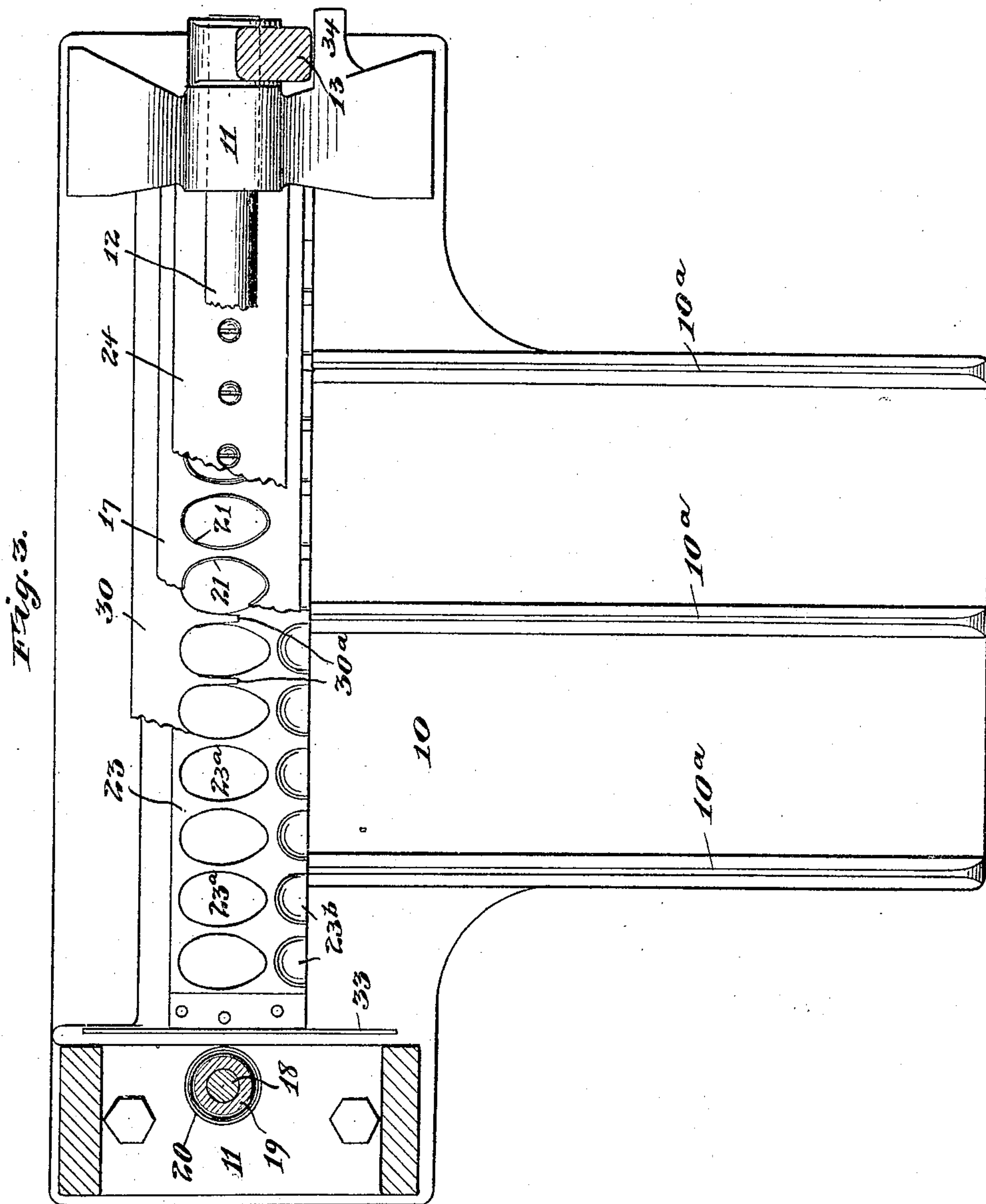
No. 892,428.

PATENTED JULY 7, 1908.

H. H. HUNGERFORD.  
WAFER CUTTING MACHINE.

APPLICATION FILED AUG. 22, 1903.

3 SHEETS—SHEET 3.



Witnesses,  
J. D. Mann,  
A. N. Graves

Inventor,  
Henry H. Hungerford,  
By *Offield Towler* Attorney.



# UNITED STATES PATENT OFFICE.

HENRY H. HUNGERFORD, OF CHICAGO, ILLINOIS, ASSIGNOR TO FRANK M. PETERS, OF CHICAGO, ILLINOIS.

## WAFER-CUTTING MACHINE.

No. 892,428.

Specification of Letters Patent.

Patented July 7, 1908.

Application filed August 22, 1903. Serial No. 170,401.

*To all whom it may concern:*

Be it known that I, HENRY H. HUNGERFORD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Wafer-Cutting Machines, of which the following is a specification.

My invention relates to machines designed more particularly for use in bakeries and confectionery establishments and having as their principal function to cut from wafer sheets, rolled dough, or other analogous sheeted material disks or blocks of predetermined size and shape, the machine of my invention belonging to that type wherein a series of vertically-reciprocating cutters are impressed upon and through the sheeted material to cut therefrom the material to be subsequently used in the desired shapes and sizes.

Many bakery products are now manufactured and sold which comprise wholly or in part a confection in the nature of a pair of thin wafers having between them a filling of chocolate or other flavored confectionery ingredient; and these confections are often designed in unique and artistic forms to render the product to which they are applied attractive to the eye as well as to the taste. The most economical and practical mode of manufacture of such sweetmeats is to cut them out of sheets of previously formed material; but where such sheets possess the delicate, brittle and spongy texture of bakery wafers, the cutting of the articles therefrom presents some difficulties in securing a clean and smooth cutting and separation of the individual articles from the sheet; and my invention has for its primary object to produce a machine capable of successful operation to secure this result.

To this end, my invention resides in a machine of the character and for the purpose specified, possessing the peculiarities of structure and mode of manipulation substantially as hereinafter described and pointed out in the claims.

A machine embodying my invention in an approved form is illustrated in the accompanying drawings, wherein—

Figure 1 is a front elevational view partly

broken away and partly in vertical section of the complete machine; Fig. 2 is a transverse vertical section through the machine; Fig. 3 is a top plan view with certain of the uprights in horizontal section and other parts broken away to disclose underlying mechanism; and Figs. 4 and 5 are top plan and edge views of the sheeted material designed to be operated upon by the particular form of machine disclosed in Figs. 1, 2 and 3.

Referring to the drawings, 10 designates as an entirety the supporting base of the machine having the general form of a low platform, on the upper surface of which are a plurality of parallel ribs or fins 10<sup>a</sup> designed to support the sheet of material as it is fed forward to the action of the cutters. On either side of the rear end of the platform 10 are mounted a pair of open framework uprights 11, in the upper ends of which is rotatably mounted a shaft 12, on one overhanging end of which latter is keyed an operating arm or handle 13. The heel of the arm or handle 13 has formed integrally therewith a short arm 14 extending at approximately right angles thereto, while keyed on the opposite end of the shaft 12 is a short arm 15 having the same form and lying parallel with the arm 14.

The free ends of the short arms 14 and 15 are forked, as shown in Fig. 1, and pivotally connected with the upper ends of a pair of links 16, in and between the lower ends of which latter is pivotally mounted at its ends a horizontal cutter-bar 17. This bar 17 is mounted to rise and fall over a pair of guide-posts 18 which engage holes formed there-through near each end, said bar being preferably provided with depending guide-sleeves 19 below said holes to secure a more extended bearing of the bar on its guides. Surrounding the posts 18 and sleeves 19 are coil-springs 20, the expanding force of which is exerted between the side steps of the platform 10 in which the posts are mounted and the under side of the bar 17 near the opposite ends thereof, respectively, thereby exerting a bodily lifting action on said bar. The bar 17 is apertured at close intervals to receive the upper ends of a series of annular cutters 21, which depend therefrom and may be secured therein by any suitable means, as,



for instance, by the set-screws 22 shown in Fig. 2. The cutters 21 may be given any annular conformation, according to the desired conformation of the articles to be cut out thereby, the cutters herein shown being almond-shaped in cross-section; but an important constructional feature thereof resides in providing the lower cutting edge of the same with a series of pointed teeth or serrations indicated at 21<sup>a</sup>.

23 designates as an entirety a horizontal stationary die member or matrix mounted on the back of the platform 10 parallel with and directly beneath the cutter-bar 17. This matrix has formed therethrough a series of openings 23<sup>a</sup> corresponding in dimensions, contour and spacing with the cutters 21, and in advance of said series of openings, a corresponding series of indentations 23<sup>b</sup> corresponding in dimensions and form to the rear blunt ends of the openings 23<sup>a</sup>.

Slidably mounted on the posts 18 above and parallel with the cutter-bar 17 is a bar 14, the outer ends of which are pivotally carried in the lower ends of a pair of links 25, which latter are pivoted at their upper ends to the inner faces of the arms 15 above the pivotal connections of the arms 14 and 16 herewith. The bar 24 is provided on its upper side with a pair of sleeves 26 surrounding the posts 18 and constituting an elongated bearing for the bar thereon, while secured to and pendent from its under surface is a series of ejectors in the form of plungers 27 corresponding in contour to the cutters 21, and of a size and position relatively to said cutters such as to internally telescope the latter when the ejectors and cutter-bars are caused to approach each other.

Mounted on top of the posts 18 are a pair of inwardly-extending horizontal bracket-plates 28, which at their inner ends are adapted to receive a pair of rods 29 vertically slidable therethrough, which rods support at their lower ends a cleaner-bar 30, this latter being somewhat behind the cutters, but provided with edgewise-extending horizontal fingers 30<sup>a</sup> so disposed as to lie between adjacent cutters. The rods 29 are supported by the brackets 28 by means of coil-springs 31 surrounding the upper ends of said rods and their opposite ends engaging the upper face of the brackets and the under sides of the heads 29<sup>a</sup> of the rods. Cotter-pins 32 passed through the rods below the bracket-plates 28 limit the upward movement of the rods and cleaner-bar under the action of the springs 31.

Extending along opposite sides of the matrix 23 and projecting slightly above the top thereof are a pair of guards 33 designed to prevent the dropping of fragments of the material on the sides of the base.

Figs. 4 and 5 of the drawings illustrate the character and form of material designed to be operated upon by the machine hereinabove described and shown in the drawings; this material consisting of a pair of thin wafer-sheets A, A' having an intermediate chocolate or other filling B. At intervals corresponding to the lateral spacing of the cutters of the machine, this sheeted material has formed therein, in parallel rows, during the process of manufacture, almond-shaped figures C produced by surface elevations or swellings of the wafer-sheets or coverings and correspondingly shaped and thickened fillings, the object being to make a confection having the general form and appearance of an almond, for which purpose it is, of course, necessary to separate out the figures C from the sheet. To do this by the machine herein described, a sheet of the material corresponding to the width of the machine and having a plurality of rows of figures C therein is laid across and supported upon the ribs 10<sup>a</sup> of the platform, with the foremost row of figures seated in the openings 23<sup>a</sup>. Thereupon the handle 13 is depressed from the elevated position shown in Fig. 1 and in dotted lines in Fig. 2, to the full line position shown in the latter figure. Through the arms 14 and 15 and the link connections 16 and 25, the cutters and ejectors are simultaneously depressed, the cutting edges 21<sup>a</sup> of the former piercing the sheeted material around the margins of the figures C and completely severing them from the sheet. When this cutting action is completed, the toggle-arms 15 and 16 at one side of the machine and the companion arms 14 and 16 at the other side have reached and slightly passed the straight line position, while the corresponding toggle-arms 15 and 25 at one side and 14 and 25 at the other are still approaching the straight line position, whereby the plungers or ejectors 27 are carried down through and below the lower cutting edges of the cutters, thereby ejecting the figures cut from the sheeted material and permitting them to drop into any suitable or convenient receptacle disposed beneath the hollow platform 10. When the cutter-bar 17 has been depressed to a position in which it engages the cleaner-bar it carries the latter with it against the action of the springs 31; while, when the cutter-bar is subsequently raised the cleaner-bar will rise with it until the cotteners 32 engage the brackets 28 after which the cutters will rise through and past the cleaner-fingers. In this manner a relative sliding movement is created between the cutters and interposed cleaner-fingers at each reciprocation of the former which thoroughly clears out any particles of the material operated upon that may tend to stick between and clog the cutters.



The office of the springs 20 is, of course, to restore the parts to elevated position after each cutting operation, for which purpose it is necessary only to elevate the handle 13 sufficiently to draw the toggle-arms back past their dead center, whereupon the expansive energy of the springs suffices for the rest. The upward swing of the arm 13 and of the parts connected therewith and operated thereby may be limited by a bracket 34 projecting laterally from one of the uprights 11 into the path of movement of the arm 14 and constituting a stop for the latter at its most elevated position.

The function of the series of indentations 23<sup>b</sup> in the front margin of the matrix is to form seats for the blunt ends of the row of figures next to the row engaged by the cutters and thereby correctly position and firmly hold the latter prior to and during the cutting operation. As each row of figures is cut out and discharged, the sheet is advanced one row into the machine, and so on until the last row of figures in the sheet has been cut out and discharged.

While I have described my invention in connection with a cutter for wafer-sheets, sheets of dough and the like, yet it is obvious that the machine is capable of use in connection with other articles and materials than those herein mentioned; and I do not, therefore, limit the same to its use in connection with the particular articles and products hereinabove specified. When employed however, as a cutter for wafers and sheets of other similar brittle and spongy material, the peculiar character of the cutting edges of the cutters as hereinabove described is found to be particularly advantageous. I have found in practice that a plain sharp edge will not cut such material smoothly and cleanly, but produces a ragged edge more or less cracked and splintered inwardly of both of the margins created thereby. The serrated or toothed edge herein shown and described, however, produces a sharp clean cut owing to the fact that each of the pointed teeth separately pierces the brittle surface of the material and subsequently exerts a shearing rather than a compressing cutting action thereon. This character of the cutters I therefore regard as of prime importance, especially in connection with a machine designed to operate on the brittle and fragile material specified. In the cutting of sheets of dough as in the manufacture of cookies, cakes, ginger-snaps, and like articles, a smooth edged cutter may, of course, be successfully employed.

It is evident that the detail structure and relative arrangement of the several parts and elements of the machine might be considerably varied without departing from the

principle thereof or sacrificing the advantages attained thereby; and hence I do not limit myself to such detail features except to the extent indicated in specific claims.

I claim:

1. In a machine of the character described, the combination with a stationary matrix containing a row of openings in the surface thereof over which the material operated upon is cut and through which the excised portions are discharged, of a superposed cutter-bar having a correspondingly positioned series of depending cutters, means for reciprocating said cutter-bar to carry said cutters into and out of said openings, a spring-retracted cleaner-bar positioned between said main bar and matrix and adapted to be struck and forced downwardly toward said matrix by said cutter-bar, and fingers carried by said cleaner-bar extending between the cutters, substantially as described.

2. In a machine of the character described, the combination with a stationary matrix containing a row of openings in the surface thereof over which the material operated upon is cut and through which the excised portions are discharged, of a superposed cutter-bar having a correspondingly positioned series of depending lateral cutters, means for reciprocating said cutter-bar to carry said cutters into and out of said openings, a correspondingly positioned series of ejector plungers, means for reciprocating said plungers through said cutters and matrix openings, a spring-retracted cleaner-bar positioned between said cutter-bar and matrix and adapted to be struck and forced downwardly toward said matrix by said cutter-bar, and fingers carried by said cleaner-bar extending between the cutters, substantially as described.

3. In a machine adapted to cut wafers and other sheeted material of brittle texture, the combination with a matrix on which the sheet is supported, of one or more cutters reciprocable toward and from said matrix, said cutters having their cutting edges formed by continuous rows of sharp pointed teeth, adapted to simultaneously pierce and cut the material, substantially as set forth.

4. In a machine adapted to cut wafers and other sheeted material of brittle texture, the combination with a matrix containing openings in the surface thereof on and above which the sheet is supported, of a series of annular cutters reciprocable into and out of said openings, said cutters having their cutting edges formed by continuous rows of sharp pointed teeth adapted to simultaneously pierce and cut the material, substantially as and for the purpose set forth.

5. In a machine adapted to cut out raised figures from a plain sheet of material in



which said figures are incorporated, the combination with a series of cutters conforming in cross-section to the outline of said figures, of a matrix toward and from which said cutters are reciprocated, said matrix having in the surface thereof a series of openings to receive a row of the raised figures to be cut from the sheet, and in advance thereof a

series of indentations constituting seats for the next row of figures to be subsequently operated upon by the cutters, substantially as described. 10

HENRY H. HUNGERFORD.

Witnesses:

ALBERT H. GRAVES,  
FREDERICK C. GOODWIN.