

H. D. PERKY.

PNEUMATIC PANNING OR DISTRIBUTING MACHINE.

(Application filed Sept. 29, 1900.)

5 Sheets—Sheet 1.

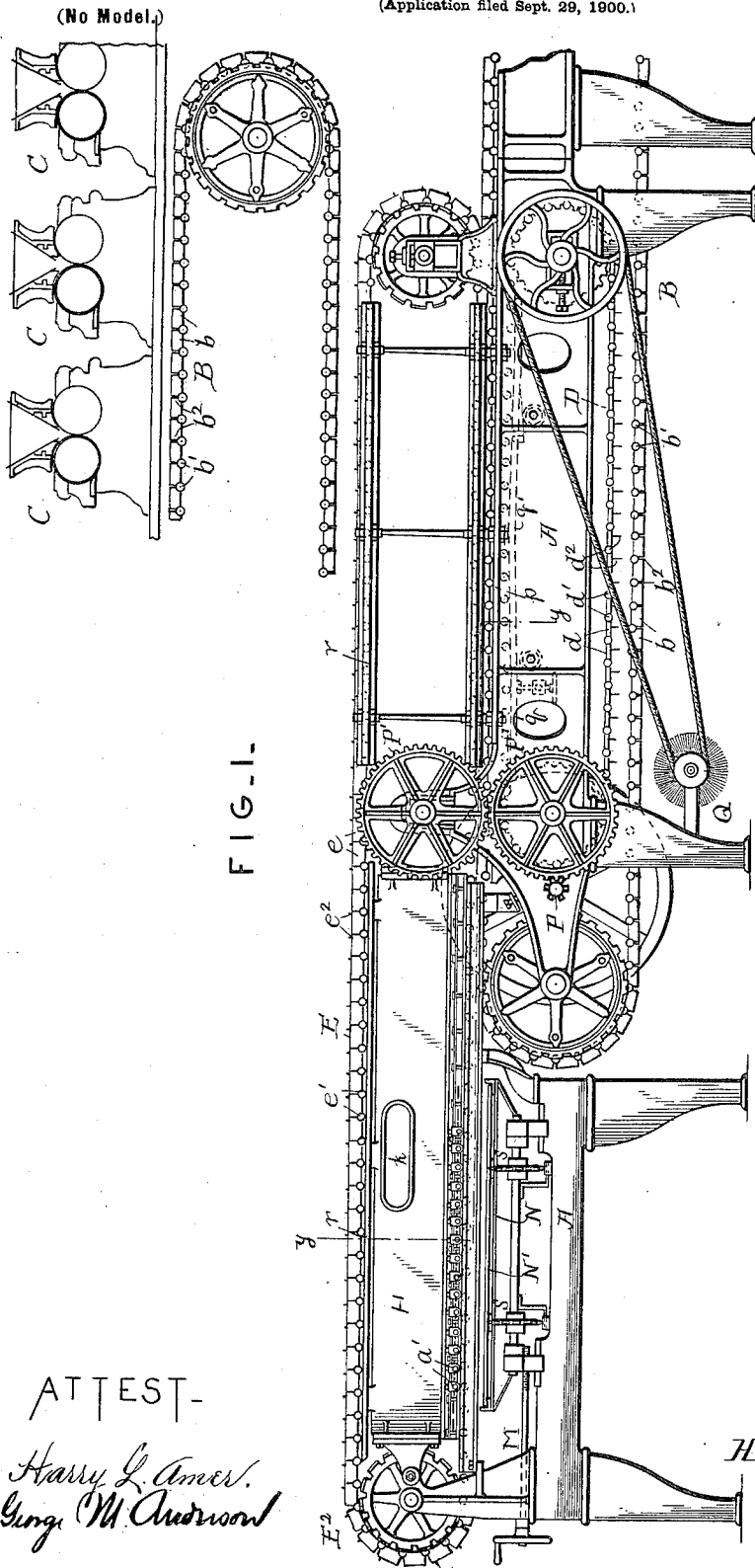


FIG. 1.

ATTEST-

Harry L. Amer.
George M. Anderson

INVENTOR.

Henry D. Perky.
By
E. W. Anderson
his Atty.

No. 678,625.

Patented July 16, 1901.

H. D. PERKY.

PNEUMATIC PANNING OR DISTRIBUTING MACHINE.

(Application filed Sept. 29, 1900.)

(No Model.)

5 Sheets—Sheet 2.

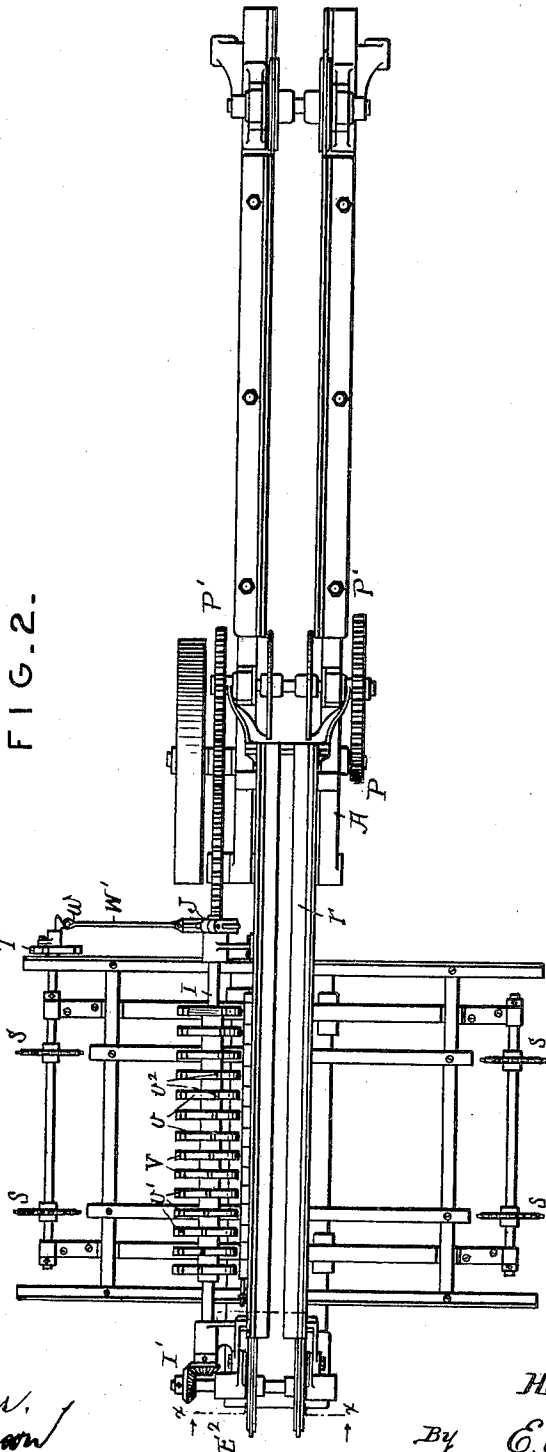


FIG. 2.

ATTEST-

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PNEUMATIC PANNING OR DISTRIBUTING MACHINE.

(No Model.)

(Application filed Sept. 20, 1900.)

5 Sheets—Sheet 3.

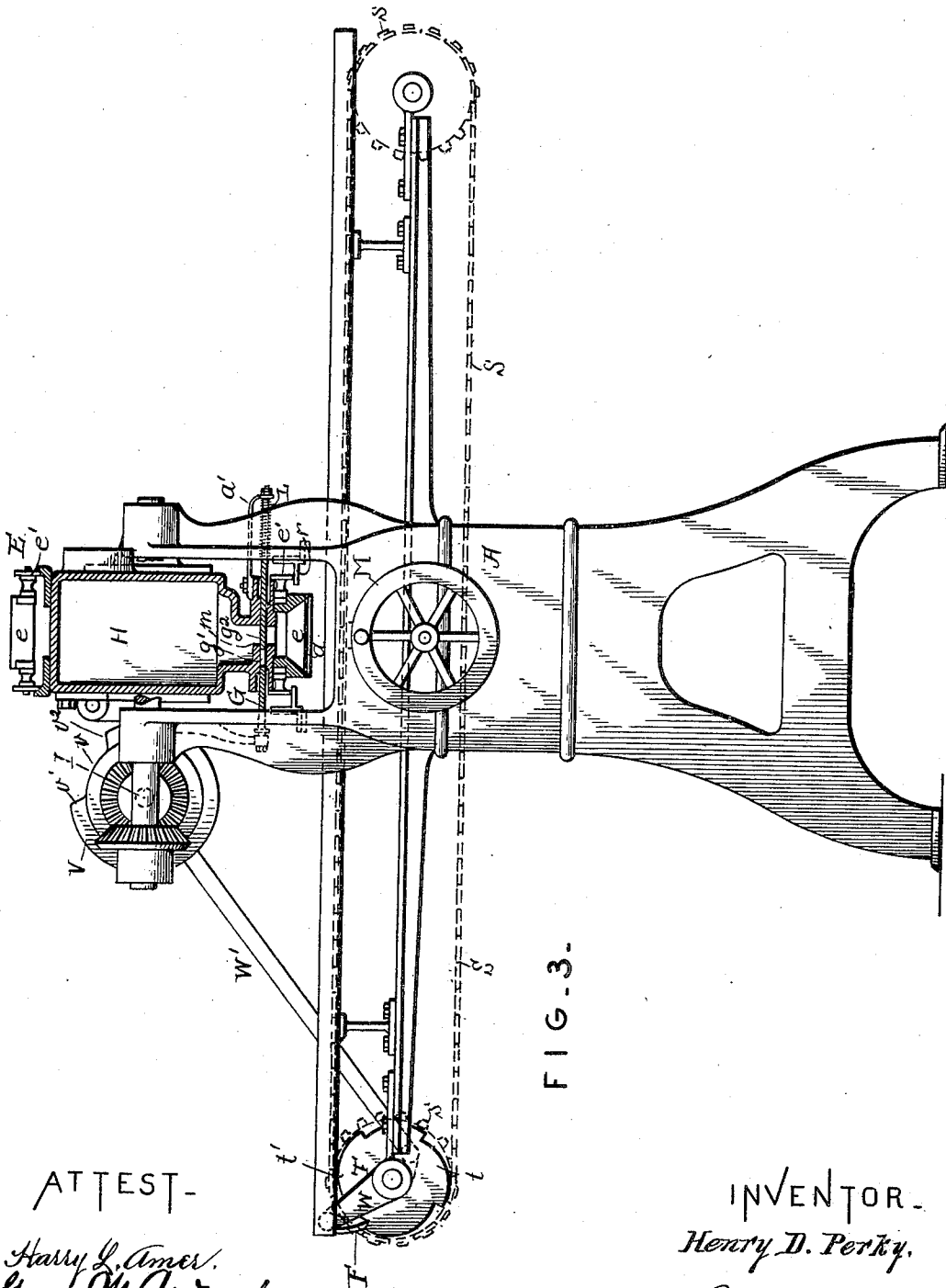


FIG. 3.

ATTEST-

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PNEUMATIC PANNING OR DISTRIBUTING MACHINE.

(No Model.)

(Application filed Sept. 29, 1900.)

5 Sheets—Sheet 4.

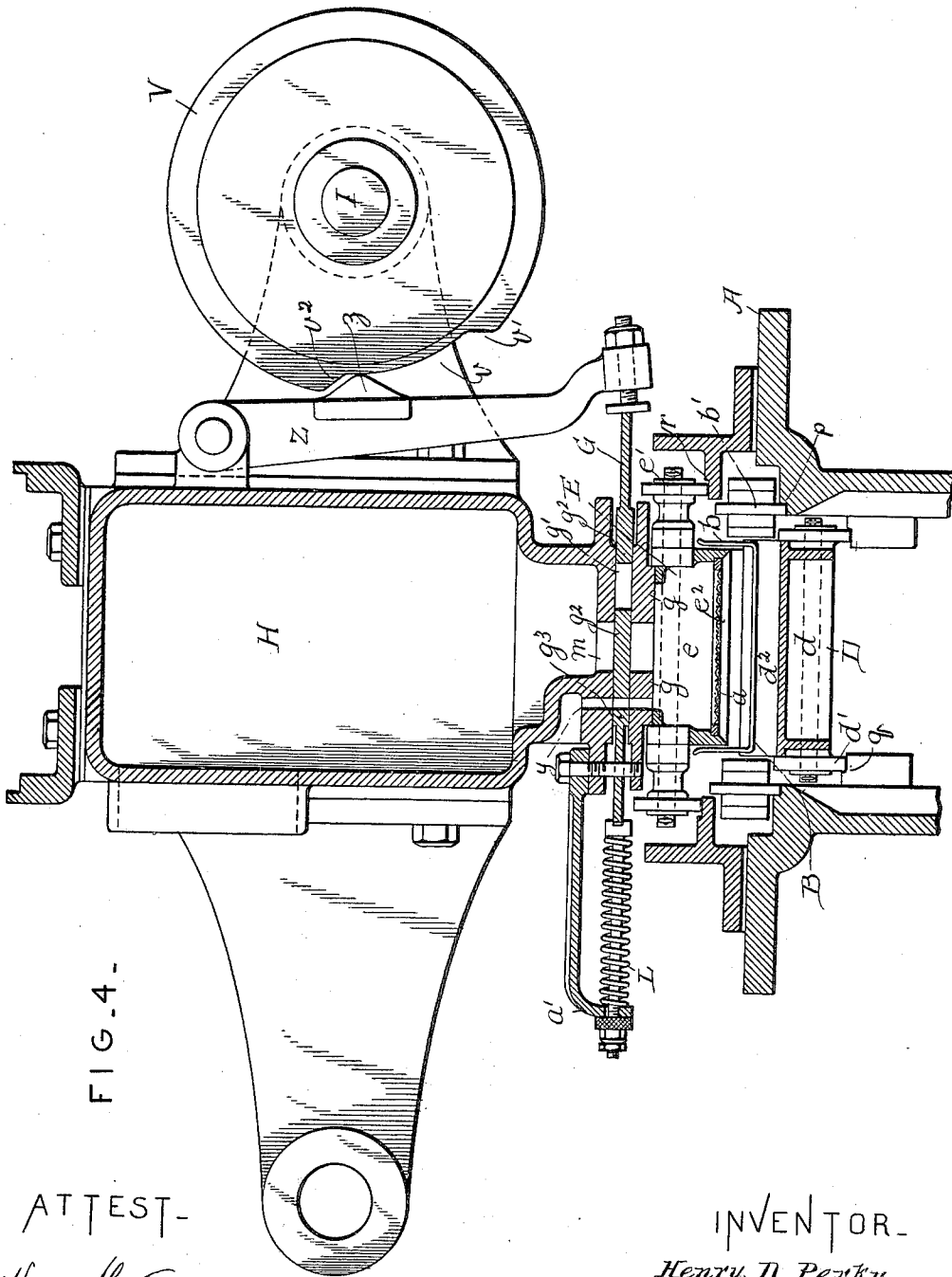


FIG. 4-

ATTEST-

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PNEUMATIC PANNING OR DISTRIBUTING MACHINE.

(Application filed Sept. 29, 1900.)

(No Model.)

5 Sheets—Sheet 5.

FIG. 5.

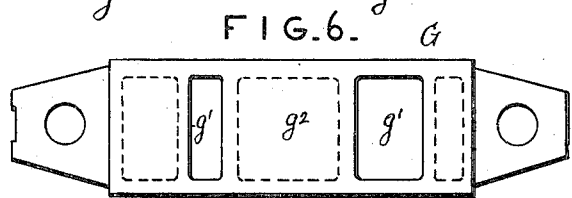
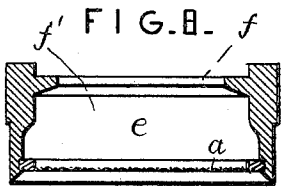
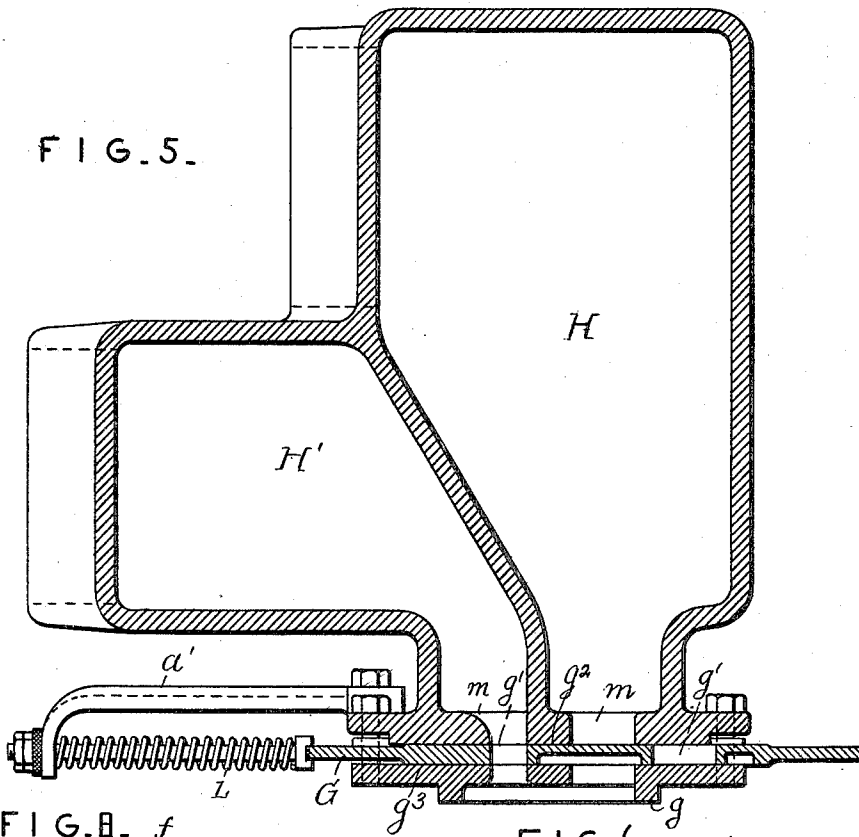
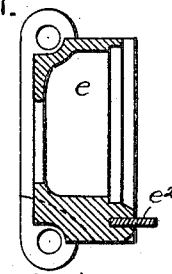
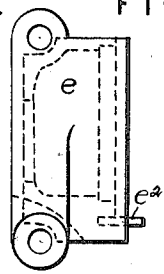
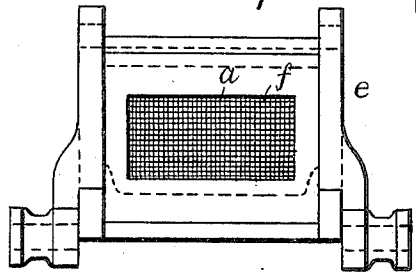


FIG. 8.

FIG. 10.

FIG. 11.

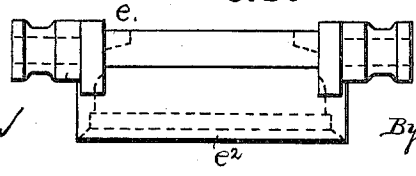


ATTEST-

FIG. 9.

INVENTOR.

Harry L. Amel,
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By

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E. W. Anderson -
his Atty.

UNITED STATES PATENT OFFICE.

HENRY D. PERKY, OF WORCESTER, MASSACHUSETTS.

PNEUMATIC PANNING OR DISTRIBUTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 678,625, dated July 16, 1901.

Application filed September 29, 1900. Serial No. 31,554. (No model.)

To all whom it may concern:

Be it known that I, HENRY D. PERKY, a citizen of the United States, and a resident of Worcester, in the county of Worcester and State of Massachusetts, have made certain new and useful Improvements in Pneumatic Panning or Distributing Machines; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the invention, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

In the accompanying drawings, Figure 1 is a side elevation of my invention, partly broken away. Fig. 2 is a plan view of the main portion of the machine, the feeding or carrier chain and divider-chains being omitted. Fig. 3 is a section on the line xx , Fig. 2. Fig. 4 is a section on the line yy , Fig. 1, showing a small opening y from the suction-chain to the atmosphere. Fig. 5 is a view similar to Fig. 4, showing two pneumatic chambers H and H' . Fig. 6 is a plan view of the valve-plate. Figs. 7, 8, 9, 10, and 11 are detail views of one of the upper divider or section links e .

The invention relates to the preparation of articles of food, and particularly to the formation and distribution of crackers, biscuits, &c., in regular order, as in panning the same for baking, the object being not only to facilitate the preparation of food in large quantities, but also to promote its sanitary character by avoiding all handling.

The invention consists in providing a pneumatic transfer in combination with a carrier, in the novel construction and combinations of parts constituting a pneumatic transfer or distributor, in the novel construction and combinations of parts constituting a continuously-acting cutting and panning machine wherein the transfer is made by a pneumatic device, and finally in the novel construction and combinations of devices for the purposes set forth, all as hereinafter more particularly described.

In the accompanying drawings, the letter A designates framework of substantial character and preferably of iron.

B represents an endless feeding belt or carrier, consisting of short sectional plates or

troughs b , on which the ribbon of food material is conveyed, being usually fed thereto by a series of reducing-machines (indicated at CC) or in any other desirable manner.

When reducing-machines such as are indicated in the drawings are employed, it is designed that the ribbon or continuous layer of material shall be formed by shredding grain, as described in patents which I have heretofore obtained. In such a combination, therefore, it is intended that the grain shall not be touched by hand from the time it is grown in the field until after it is cooked and ready for use as food.

The short sectional plates or troughs b of the endless carrier B are provided with rollers b' in order that they shall travel freely on the ways or tracks p , provided in the framing. Between the sectional plates or troughs b is a narrow interval of separation b^2 for the passage of devices which serve to divide the ribbon of food material into sections.

D represents the lower endless divider or cutter chain, which consists of a belt of links d , having rollers d' , which serve to facilitate their movement on the ways or tracks q of the framing, these ways or tracks having a slight arch or rise at q' , whereby an upward movement of the cutter-links d is gradually effected in order to cause the separator-blades d^2 of said links to pass upward through the intervals of separation b^2 of the feeding belt or carrier B . Each link d is provided with a blade d^2 , which is transversely arranged in the link-body and secured thereto either rigidly or adjustably, as may be found desirable.

The links of the lower divider belt or chain D are arranged to break joints with the trough-links b in order that the blades of the former shall have proper position to pass upward through the interval between the trough-links.

Compared with the length of the feeding-carrier B the lower divider-chain is short, being designed only to assist in effecting the separation of the material on the carrier B into sections.

E represents the endless chain of suction-links e , which are provided with rollers e' to facilitate their movement on the tracks or ways r of the framing. In the construction shown in the drawings this endless chain E

is arranged above the carrier B and is geared to move at the same rate of speed therewith, as is also the lower divider-chain D. Each link *e* of the chain E carries a divider-blade *e*², which may be rigidly secured to its frame or may be made adjustable or even removable, as in some cases it may be desirable to include the length of several links in a section of the food material on the carrier. The section-link *e* consists of a rectangular tubular or open frame, its upper portion having an opening *f* communicating with a passage *f*¹ through the link, the lower portion of said passage being also open, but covered or guarded by a wire-cloth or perforated bearing *a*, the design being to allow air to pass upward or downward through the link freely, as may be required in the operation of the machine. The upper surface of the link *e* is designed to move along in approximate contact with a valve-seat *g*, as indicated in the framing, said valve-seat being provided for use in connection with a transverse reciprocating valve-plate G.

The endless suction-chain E extends beyond the endless carrier B and the endless divider-chain D sufficiently to include the pneumatic chamber or chambers H H'. Usually a single pneumatic chamber H will be sufficient, this being a suction or exhaust chamber, kept in exhausted condition by means of a suitable exhaust-fan, the passage to which is indicated at *k*; but if the food-sections are of such character that they adhere too closely to the wire-cloth bearings *a* of the suction-links it may be necessary to employ the pressure-chamber H', which is provided with a connection to a blower-fan. An opening for the admission of atmospheric air when the suction is cut off will, however, usually prove sufficient to release the biscuit or cracker section from the wire-cloth bearing *a*, which should be treated with paraffin.

The valve-plates G are arranged in series in ways or seats *g*³ of the frame, these being located in the lower portion or bottom of the pneumatic chamber. The number of valve-plates may be equal to one or two more than the number of biscuits or food-sections designed to form a row on the pan or receiver. Each valve-plate is designed to operate in conjunction with a link of the suction-chain above described, as such link comes into position or nearly into position below it. The series of valve-plates corresponds with the series of openings *m* of the pneumatic chamber, and such series is of suitable length to correspond with the length of the pan or receiver, such as indicated at N', Fig. 1, so that when these openings or suction-passages are closed by means of the valve-plates the food-sections will be deposited on the pan in a row. Besides the openings *m* openings are provided in the bottom of the first portion of the pneumatic chamber. The latter openings are not provided with valve-plates, as they are de-

signed to be in continuous action, serving to convey the food-sections or biscuits from the carrier B to the valved portion of the pneumatic chamber, where the depositing operation is effected.

The valve-plates G are provided with air passages or openings *g*¹ and with stop or cut-off portions *g*².

Below that portion of the pneumatic chamber which is provided with valves is located the pan-carrier table N, which consists of an adjustable frame provided with bearings for the shafts of the sprocket-wheels *s*, which carry the transverse sprocket-chains S or endless carriers on which the pans or trays are laid. These sprocket-chains are intermittently operated by means of a pawl F and a ratchet-wheel T, of which one of the teeth (indicated at *t*¹) is longer circumferentially than the other teeth *t* in order to provide sufficient movement of the pans where they lie adjacent to each other to pass from the last row of biscuit-sections of a filled pan to the place of deposit on the succeeding pan where the first row of biscuit-sections is to be dropped. The ratchet-wheel T is operated through the pawl F and pivoted connection W by the crank or eccentric J, which is carried on the end of a shaft I, which also carries a series of circular cams V V, each of which corresponds to one of the valve-plates. The cams V are each formed with a circumferential depression *v*, the depression of each succeeding cam being a little longer than that of the preceding cam and so arranged that while the rear inclines *v*¹ are in line with each other and designed to operate together the forward inclines *v*² are spirally arranged, so that they will act in succession. A series of arms Z are pivoted to the framing or to the wall of the pneumatic chamber, said arms corresponding in number to the valve-plates and being provided with projections *z*, whereby they engage the circular cams hereinbefore referred to. The free ends of the arms Z are designed to engage projections or arms of the valve-plates G and serve to give motion to said plates when the cams are rotating. Reverse motion is given to the valve-plates by means of springs L, arranged on the stems of the valve-plates, said springs engaging arms *a*¹ of the framing through perforations in which the stems pass. The valve-plates are adjustable, the stems being threaded and provided with nuts for the purpose.

The shaft I, carrying the cams, is operated from the shaft of the end sprocket-wheel E² of the endless chain E by means of bevel-gearing, (indicated at I'.)

Under the arrangement indicated while the valves are opened successively to avoid waste of the exhaust they are closed simultaneously, so that a row of biscuits or food-sections is dropped from the links of the pneumatic belt E to the receiver of the pan on the carrier-table.

The connecting arm or rod W' , which extends from the eccentric J to the pawl F , is usually pivoted at w to provide for lateral play; which is advisable in order to allow adjustment of the pan-carrier frame to accommodate said frame to the drop movement of the valves. This adjustment may be effected by the hand-screw M , having a pivotal seat in the framing.

Q indicates a rotary brush, which is designed to act upon the trough-links of the carrier-belt to keep them clean.

The operation may be described as follows:

The trough-carrier links conveying the ribbon of food material as it is formed thereon by deposit from the reducing-machines move along the tracks of the framing and pass between the lower divider-chain and the suction-belt. The links of these belts being provided with knives or blades, which operate, preferably, by a pressing or abutting movement, serve to subdivide the band or ribbon of food material into sections. After this subdivision the lower chain of cutter-links leaves the work and the chain of trough-links having conveyed the food-sections under the pneumatic chamber also leaves the work. The biscuits or food-sections being now taken up by the exhaust and being carried in contact with the wire-cloth bearings a along under the pneumatic chamber reach the valved portion, which is normally closed by the mechanism. As each link of the chain E comes under the series of valves a valve is opened, continuing the suction until a sufficient number of biscuits has been carried along the valved portion from a row, when the valves are closed simultaneously and all the biscuits of said row are dropped or deposited on the pan or receiver below. This pan or receiver remains stationary long enough to receive the row of biscuits and is then moved transversely by the action of the ratchet-and-pawl mechanism or other suitable manner the proper distance to attain a position to receive the next row of biscuits, and the action of the valves being repeated a second row of biscuits is deposited alongside the first row.

In the construction illustrated four rows of biscuits are apportioned to each pan, and the fourth ratchet-tooth is made sufficiently longer than the others to allow in the movement of the pan-carrier chains for the interval between the pans.

It will be observed that the drop motion of the valves, wherein they simultaneously close off the exhaust, is intermittent, taking place in the intervals of the intermittent motion of the pan-carrier. In other words, when the pan-carrier is still the simultaneous cut-off or drop motion of the valves takes place quickly enough to allow time for the drop of the biscuits to the pan before the latter is again shifted. To effect this movement of

the valves and the movement of the pan-carriers, the cam-shaft is usually connected to the shaft of the end pulley of the chain E by means of bevel-gearing. In some cases, however, the receiver may have continuous movement.

The machine may be run by means of power applied to a shaft F and gearing F' , operating the shafts of the sprocket-wheels B' of the feeding-chain D' of the lower cutter-chain and E' of the pneumatic chain.

Having described this invention, what I claim, and desire to secure by Letters Patent, is—

1. A pneumatic panning or distributive depositing-machine, consisting of an endless belt having open sections provided with perforated or wire-cloth bearings, and adapted to operate in connection with a transversely-moving receiver, and an exhaust-chamber having valved openings, substantially as specified.

2. In a pneumatic panning or distributive depositing-machine, an endless belt having open sections provided with perforated or wire-cloth bearings, substantially as specified.

3. An endless chain or belt having open sections provided with divider-blades, and perforated or wire-cloth bearings, substantially as specified.

4. In a pneumatic panning or distributive depositing-machine, the combination with an exhaust-chamber, and its valved openings, of an endless belt of open links, and perforated or wire-cloth bearings attached to the bottoms of said links, substantially as specified.

5. In a pneumatic panning or distributive depositing-machine, the combination with an endless feeding-carrier, and chain cutters or dividers operating in conjunction therewith, of an exhaust-chamber having valved openings, an endless belt of suction-links, and devices for operating the parts, substantially as specified.

6. The combination with an exhaust-chamber, its openings and valves, an open-link suction-belt, an endless feeding-belt and transverse endless pan-carriers, of devices for giving reciprocating motion to said valves, and intermittent motion to said pan-carriers, substantially as specified.

7. The combination with a pneumatic chamber, its openings and valves, the open-link suction-belt, and the transverse receiver, of the endless feeding-belt, the series of valve-operating cams and devices, the cam-shaft and eccentric and the ratchet-and-pawl devices in connection with said eccentric, for giving intermittent motion to said receiver, substantially as specified.

8. The combination with a pneumatic exhaust-chamber, and an endless feeding belt or carrier, of a suction-belt operating in connection with said exhaust-chamber, valve devices for cutting off the exhaust, a transverse

receiver and mechanism for giving intermittent motion to said receiver, and alternate intermittent cut-off motion to said valve devices, substantially as specified.

5 9. The combination with a pneumatic exhaust, its valves, and a continuous feed-belt of an endless suction-belt operating in connection with said exhaust, valves and feed,

and a transversely-moving receiver, substantially as specified. 10

In testimony whereof I affix my signature in presence of two witnesses.

HENRY D. PERKY.

Witnesses:

MAUD Y. ANDERSON,
BERTHA E. SUTTON.