July 28, 1936. F. M. BROWN 2,048,776

MEANS FOR USE IN THE PACKING OF EGGS AND LIKE SHAPED ARTICLES

Filed July 21, 1933 2 Sheets-Sheet 1

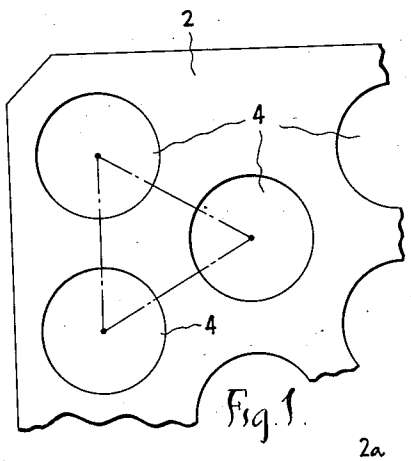


Fig. 1.

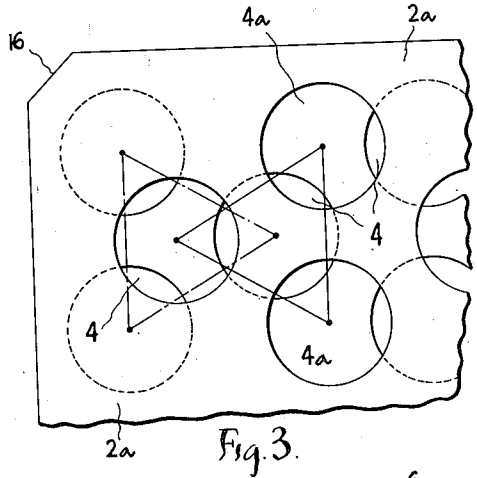


Fig. 3.

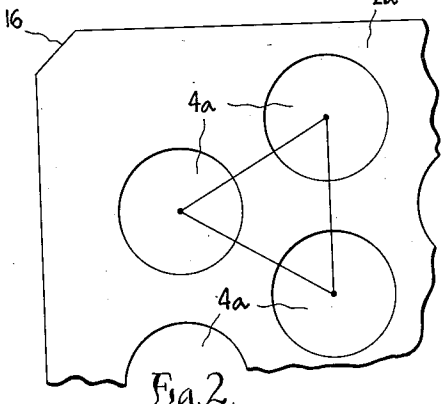


Fig. 2.

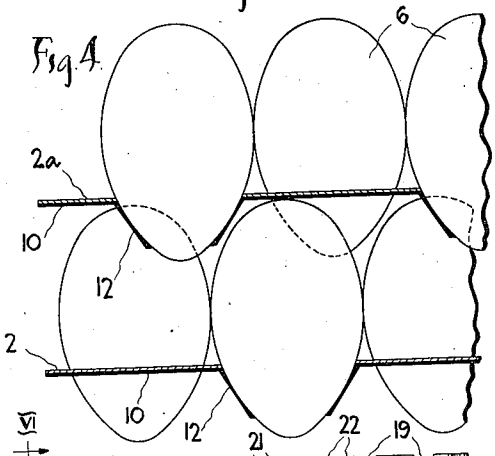


Fig. 4.

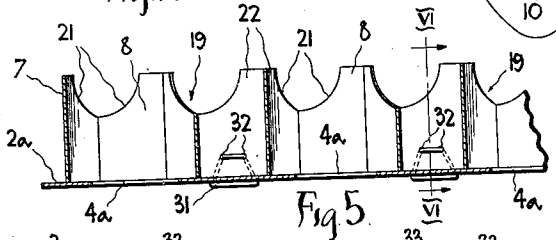


Fig. 5.

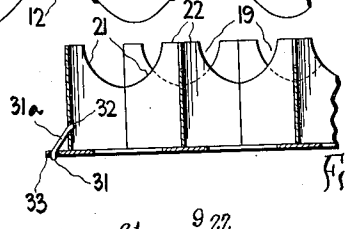


Fig. 6.

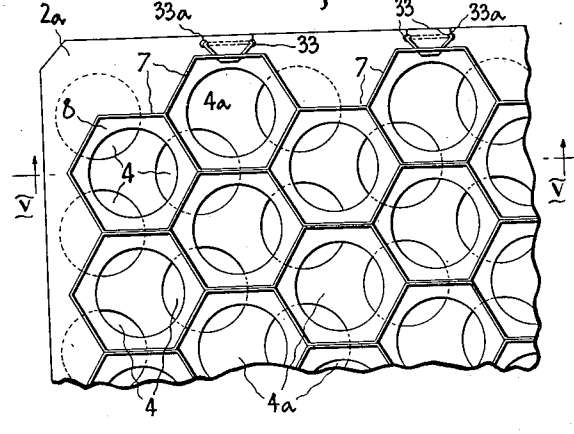


Fig. 7.

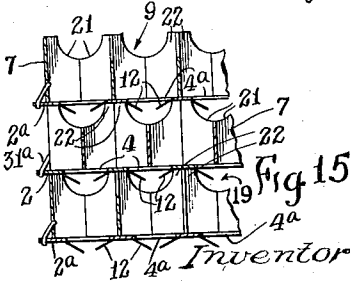


Fig. 15.

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MEANS FOR USE IN THE PACKING OF EGGS AND LIKE SHAPED ARTICLES

Filed July 21, 1933 2 Sheets-Sheet 2

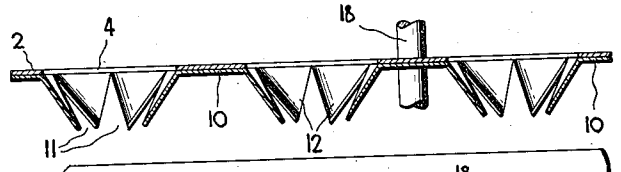


Fig. 8

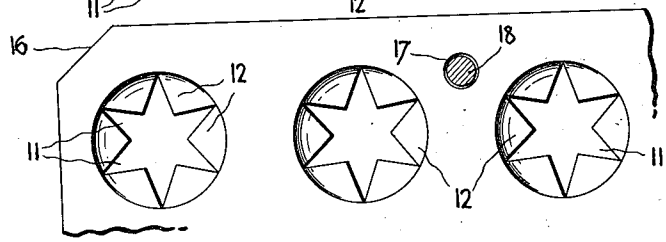


Fig. 9

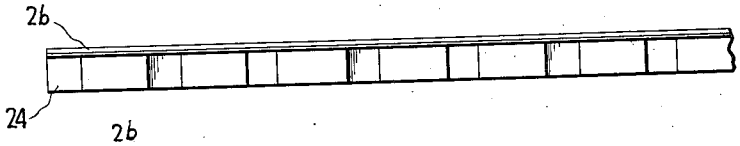


Fig. 10

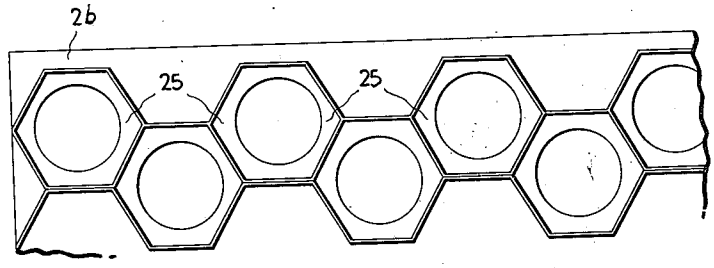


Fig. 11

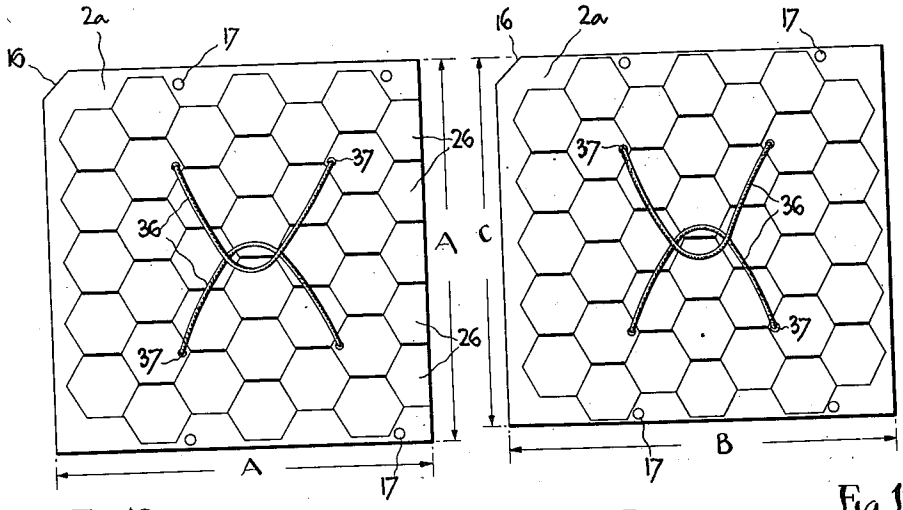


Fig. 12

Fig. 13

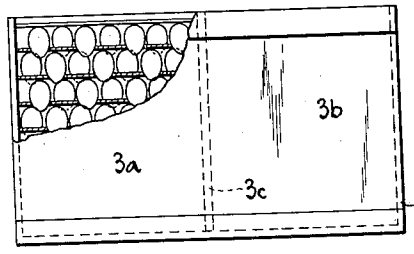


Fig. 14

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UNITED STATES PATENT OFFICE

2,058,776

MEANS FOR USE IN THE PACKING OF EGGS AND LIKE SHAPED ARTICLES

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Application July 21, 1933, Serial No. 681,585
In Australia May 2, 1933

11 Claims. (Cl. 217—34)

This invention relates to means for use in the packing of articles of globular, oval, or like shape, and refers more particularly to means for packing eggs into crates for transport or storage purposes, the egg being prevented from contact with each other in order to minimize the possibility of breakages.

It is at present customary to pack eggs into crates of a standard size in superposed tiers or layers each of which is separated from adjacent upper and lower layers by horizontal supporting plates or partitions of cardboard, fibre board, or such like material upon which the eggs rest. Located between adjacent plates is a series of intersecting vertical partitions constructed in the form of a collapsible cell unit which is known in the trade as an "egg filler". These intersecting vertical partitions form a plurality of separate compartments, one for each egg, and each compartment is generally of square shape in plan.

Under such conditions of packing the voids or spaces between or around the individual eggs amount to a considerable proportion of the cubic capacity of the crate and the present invention aims to reduce such voids or wastage of space to a minimum so that a greater number of eggs may be packed in a crate of given size, and thus economize in transport and storage charges, while at the same time ensuring that the eggs or other articles are maintained out of contact with each other and not liable to breakage.

A more specific object of the invention is to provide improved means for packing eggs whereby a substantial increase in the number of eggs that may be accommodated in a crate of standard dimensions is obtained, compared with the number of eggs that may be packed in a crate of similar capacity in accordance with existing practice.

A further object of the invention is to provide an improved cell unit or "egg filler" which may be employed with existing types of plain horizontal supporting plates or partitions with the result that a greater number of eggs may be packed in a standard crate than has heretofore been possible.

A still further object of the invention is to provide novel horizontal supporting and centering plates or partitions for use with the improved cell units whereby a still greater increase in the number of eggs that may be packed in a standard crate is obtainable.

According to the present invention the lower extremities of the eggs or other articles supported by each supporting and centering plate project into the spaces between the upper extremities of the eggs on the next lower supporting and centering plate so that it is possible to provide more tiers or layers in a crate of given height than is possible where the bottoms of the eggs of one tier are disposed above the tops of the eggs of the next lower tier in accordance with existing practice.

Referring to the drawings which form part of this specification—

Figure 1 is a fragmentary plan view of one of a pair of co-operating supporting and centering plates or partitions in accordance with the present invention.

Figure 2 is a fragmentary plan view of the companion supporting and centering plate; whilst Figure 3 shows the two members superposed in co-operative positions.

Figure 4 illustrates diagrammatically the manner of packing eggs in superposed tiers or layers in accordance with the invention.

Figure 5 is a sectional elevation, on a reduced scale, taken on the line V—V of Figure 7 and showing an improved cell structure or "egg filler" in accordance with the present invention.

Figure 6 is a cross section taken on the line VI—VI of Figure 5.

Figure 7 is a plan view of Figure 5.

Figure 8 is a fragmentary longitudinal section and Figure 9 is a plan view of one of the supporting and centering plates showing shock absorbing seatings for the eggs or other articles.

Figure 10 is an elevation, on a reduced scale, of a supporting and centering plate provided with a depending base for positioning at the bottom of a crate or the like.

Figure 11 is an inverted plan view of Figure 10.

Figure 12 is a diagrammatic plan view showing one of the improved supporting and centering plates and an associated cell structure for fitting within an egg crate of standard dimensions.

Figure 13 is a similar view of Figure 12 showing a supporting and centering plate and a cell structure adapted to fit within a crate of substantially the same cubic capacity as a standard crate but of slightly different dimensions.

Figure 14 is a diagrammatic side elevation of a standard egg crate showing the eggs packed in accordance with the present invention.

Figure 15 is a broken vertical sectional view showing the relation of the supporting plates and cell structures.

In accordance with the present invention I provide one or more pairs of supporting and centering plates or partitions 2 and 2*a* respectively, each preferably consisting of a fibrous, cardboard,

strawboard or like sheet or blank, provided with apertures as hereinafter described, these plates being adapted for arrangement in vertically spaced relationship within a crate or the like 3 as hereinafter described. Each supporting plate 2, 2a is provided with a series of apertures 4, 4a each adapted to accommodate the lower end portion of an egg or the like 6 as seen more clearly in Figure 4.

The various supporting and centering plates are spaced apart by open ended cell structures 7, hereinafter referred to, which are preferably of a collapsible nature and provide a separate compartment 8 for each egg or like article.

As seen more clearly in Figures 1 to 4 the apertures 4, 4a in each co-operating pair of the supporting and centering plates 2, 2a are so arranged that when the plates 2, 2a are operatively assembled in vertically spaced relationship the apertures 4 are out of vertical alignment with the apertures 4a, the center of the apertures 4a in the upper plate 2a (except those apertures adjacent the edges of the plate 2a) being located above the mid-point between three adjacent apertures in the lower supporting and centering plate 2.

According to one suitable embodiment the apertures in each supporting and centering plate are arranged in horizontal rows in staggered formation in such a manner that straight lines drawn between the centres of any three adjacent apertures form an equilateral triangle, as seen in Figures 1 and 2. When eggs are placed into apertures arranged in this triangular formation there is provided between the upper extremities of each triangular group of eggs a space which is capable of accommodating the lower end portion of an egg carried by the next higher supporting and centering plate. Thus as the apertures in each co-operating pair of supporting plates are arranged out of vertical alignment as aforesaid, the lower end portions of the eggs on the upper supporting plate nest snugly within the spaces formed between the upper end portions of the eggs supported by the lower supporting plate.

In order to accommodate eggs of various sizes and to provide shock absorbing seatings therefor, each aperture 4, 4a may be provided with a covering of relatively stiff paper or other suitable material in which a series of radial cuts or slits 11, for example, may be formed to provide a number of resilient flaps 12. The latter are yieldingly depressed by an egg as it is placed into its aperture and function to partially support the egg and prevent the lower extremity thereof from contacting with the upper portions of the eggs immediately beneath. The flaps 12 for the apertures 4, 4a may be conveniently cut from a sheet 10 of paper or like material which may extend across the supporting and centering plate and be secured in position by a suitable adhesive. In some cases, if so desired, the shock absorbing seatings may be dispensed with except so far as the lowest row of eggs is concerned.

One corner of each supporting and centering plate may be cut away, as at 16, to serve as a guide for correctly placing the supporting plates in position. Or the various supporting plates may be provided with co-aligned holes 17 adapted to receive vertical dowel pins or the like 18 which function to facilitate correct positioning of the superposed supporting plates.

In combination with the foregoing the invention includes a plurality of cell structures 7, each of which consists of a number of walls forming a plurality of open ended compartments 8 each adapted to accommodate an egg or the like. These compartments are preferably of symmetrical polygonal shape in plan to avoid waste space, and the particular shape thereof depends upon the arrangement of the apertures in the supporting plates. Where the apertures are arranged in staggered triangular formation as aforesaid, the compartments 8 are preferably of hexagonal shape in plan, as seen in Figure 7. It will be understood, however, that the invention is not limited to this particular shape as the compartments may be of octagonal or any other suitable shape if so desired.

In order to accommodate the lower end portions of the eggs projecting through the aforesaid apertures 4, 4a in the supporting plate, certain sections of the upper edge portions of the cell structures are cut away to form gaps 19 and concave shoulders 21 as seen more clearly in Figures 5 and 6 of the drawings. These shoulders are located beneath each aperture in the supporting plate immediately above and co-operate with the aforesaid flaps 12 in providing a seating for the eggs and preventing contact therebetween. The remaining upper edge portions of the cell units which are not cut away form a plurality of posts 22 upon which the next higher supporting plate rests in position.

One of the supporting and centering plates 2b, which is adapted for placing at the bottom of the crate, is preferably provided on its lower surface with a depending base 24 having a plurality of compartments 25 to accommodate the lower end portions of those eggs carried by the lowermost supporting plate. The height of the base member 24 is such that the eggs are maintained clear of the bottom of the crate or other surface. If desired, a layer of "wood wool" or like material may be placed beneath the lowermost supporting plate in lieu of or in combination with the aforesaid base 24.

The standard egg crate at present in common use in Australia usually includes two compartments 3a and 3b divided by a vertical partition 3c, the internal dimensions "A" of each compartment being eleven and five-eighth inches (11⅝") square. It has been found that by employing improved cell units having hexagonal shaped compartments according to this invention, in combination with existing plain supporting or division plates, it is possible to pack approximately nine per cent (9%) more eggs in the standard crate than is possible with existing types of egg packing devices embodying square cell units. If the improved apertured supporting and centering plates are employed in combination with the hexagonal shaped cell units, an increase of approximately thirty-one per cent (31%) in the number of eggs packed is obtainable.

As seen in Figure 12 the present dimensions of the standard crate prevent certain of the rows of cells of the improved cell units from being completed, as at 26. By increasing the internal length "B" of the crate to twelve and one eighth inches (12⅛") and reducing the internal width "C" to eleven and five-sixteenths ($11\frac{5}{16}$) inches as in Figure 13, it is possible to form complete cells in all rows of the improved cell unit with the result that it becomes possible for a still greater number of eggs, namely thirty-three and one-third per cent (33⅓%) to be packed in a crate of approximately the same cubic capacity as that of the standard crate.

The above percentages relate to eggs of approximately standard sizes. If it should be required to pack smaller eggs, a still greater percentage of increase will be possible in a crate according to this invention.

In order to facilitate packing and unpacking operations means may be provided for connecting each cell structure **7** to the upper surface of a supporting and centering plate whereby the two elements, while supporting a layer or tier of eggs, may be readily lifted into and out of a crate and carried from place to place. Such connecting means may advantageously consist of a number of rubber or elastic rings or endless bands **31** (see Figures 5 and 7) adapted to extend through holes **32** in marginal portions of the cell structure walls and lie against the inner surfaces of such marginal portions, and also to extend through holes **33** in marginal edge portions of the respective supporting and centering plate and lie against the underneath surface of the plate. The intermediate portions **31***a* of the rings may diverge downwardly from the holes **32** to the holes **33**. The holes **32** may be interconnected by a slit while the holes **33** may have slits **33***a* leading therefrom to the outer edge of the supporting and centering plate, such slits enabling the rubber or like rings **31** to be readily applied in operative positions wherein they securely hold the cell structure to the supporting and centering plate.

Each unit comprising a supporting and centering plate and a cell structure, with or without eggs or the like arranged therein, may be readily lifted by means of a lifting tape or the like **36** (see Figures 12 and 13). Such tape may have portions lying against the undersurface of the respective supporting and centering plate and extending through appropriately spaced holes **37** therein, the upper portions of the tape being preferably of sufficient length to enable them to overlap and be readily held with one hand.

In carrying out packing operations the supporting and centering plates and the cell structures may be successively placed in a crate or the like and the eggs or other articles inserted with the cells or compartments **8** and the apertures **4**, **4***a*. Or if desired the eggs or other articles may be inserted into the cells of the structures **7** and the apertures of the supporting and centering plates while the latter are resting upon a table or other suitable support, the loaded or charged cell structures and supporting plates being then lifted and placed into a crate by means of the lifting tapes **36**. In all instances correct arrangement of the cell structures and the supporting and centering plates is ensured by the dowel pins **18** and/or the cut away corner portions **16** of the supporting and centering plates.

Various alterations, modifications and/or additions may be embodied in the foregoing without departing from the spirit and scope of the invention as defined in the appended claims.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:—

1. Means for use in the packing of eggs and similar shaped articles in superposed layers comprising in combination a plurality of pairs of supporting and centering plates provided with apertures to accommodate the lower end portions of the eggs, the apertures in the respective supporting and centering plates of each pair being arranged out of vertical alignment in such a manner that the centre of each aperture in an upper plate is located above the mid-point between three or more adjacent apertures in the lower supporting plate of each pair, and a plurality of cell units for positioning one between each pair of supporting and centering plates, each cell unit consisting of a series of vertical walls forming a plurality of cells of hexagonal shape in plan, sections of the upper edge portions of each cell unit being cut away to form gaps adapted to accommodate the lower ends of the eggs projecting downwardly through the apertures in the supporting and centering plate immediately above, for the purpose specified.

2. For use in the packing of eggs and similar shaped articles, egg or like supporting units, each comprising a supporting and centering plate provided with apertures to accommodate the lower end portions of eggs or the like, a cell structure disposed upon the upper face of said supporting and centering plate and forming cells registering with said apertures, and removable means for retaining said cell structure to said supporting and centering plate.

3. For use in the packing of eggs or similar shaped articles the combination of parts claimed in claim 2 characterized in that said retaining means comprises a number of rubber or elastic rings or endless bands, and holes with associated slits formed in said cell structure and said supporting and centering plate to receive said endless bands, substantially as described.

4. Means for use in the packing of eggs and similar-shaped articles in superimposed layers, comprising in combination a plurality of pairs of supporting and centering plates each provided with seatings to accommodate the lower end portions of the eggs or the like of that layer, the seatings in the respective plates of each pair being out of vertical alignment with the center of each seating in an upper plate located above and centrally between three or more adjacent seatings in the lower plate, and a cell unit arranged between each pair of plates, each cell unit including a series of vertical walls providing a cell for each article supported in the lower plate of each pair, with the vertical walls cut away to receive and permit upright positioning of the lower ends of the articles in the seatings of the upper plate of each pair.

5. A construction as defined in claim 4, wherein the seatings in the plates of each pair are arranged in rows in staggered triangular formation, so that straight lines drawn between the centers of any three adjacent seatings form an equilateral triangle, the seatings in the respective plates of each pair being arranged to dispose the pairs of each triangle in an upper plate immediately above the center of a triangle in the lower plate, whereby the lower end portions of the eggs depending through the seatings in the upper plate are accommodated within the space formed between three adjacent eggs in the seatings of the lower plate.

6. A construction as defined in claim 4, wherein the seatings of the plates of each pair are provided with shock-absorbing elements for the eggs.

7. A construction as defined in claim 4, wherein the seatings of the plates of each pair are formed with shock-absorbing elements consisting of a web extending across each seating and divided along a series of radial lines to provide triangular-shaped flaps to be downwardly displaced by the arrangement of the egg in the particular seating.

8. A construction as defined in claim 4, wherein the respective plates of each pair are provided

with indicating means for predetermining the relative positions of the plates of a pair to insure the defined relation of the seatings in the respective plates.

9. Means for use in the packing of eggs or similar-shaped articles, comprising a pair of cooperating plates arranged in vertical spaced relationship and formed with seatings to accommodate the lower extremities of the eggs, said seatings being arranged in rows in staggered triangular formation, so that straight lines drawn between the centers of any three adjacent seatings form an equilateral triangle, the seatings in the respective plates of each pair being out of vertical alignment, with the apices of each triangle in an upper plate located immediately above the center of a triangle in the lower plate, the plates being formed with openings to be vertically aligned when the seatings of the respective plates are in a defined relation, and removable dowel pins cooperating with said holes to maintain their aligned relation.

10. A construction as defined in claim 4, wherein the lowermost plate of the series of pairs of plates has a depending base functioning as a distance piece to maintain the lower ends of the eggs projecting through said lowermost plate clear of the bottom of a crate or the like in which the plates are arranged.

11. An improved cell unit for use between egg-supporting plates arranged in superimposed pairs, each cell unit being made up of a plurality of vertical walls to define a cell for the support of an egg cooperating with the lowermost plate of a pair, the upper edges of the vertical walls of the cell units being cut away to form gaps to receive the lower ends of eggs projecting downwardly through the seatings of the uppermost plate of the pair, the cut-away portion of the upper edges of the cells providing concave shoulders to cooperate with shock-absorbing members associated with the seatings of the plate, the remaining upper edge portions of each cell unit providing a plurality of supports to carry the uppermost plate of the pair.

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