

Dec. 21, 1937.

E. ENGELBREKTSSON

2,103,066

BEEHIVE

Filed April 25, 1933

3 Sheets-Sheet 1

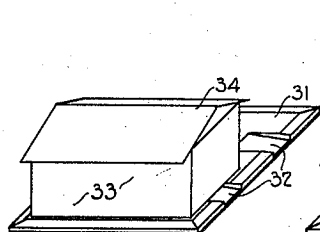


FIG. 1

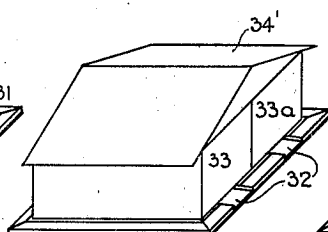


FIG. 2

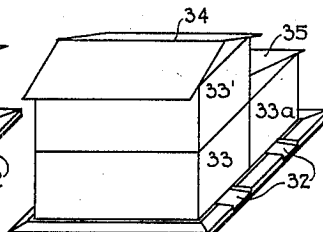


FIG. 3

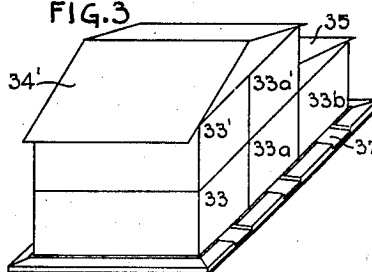


FIG. 4

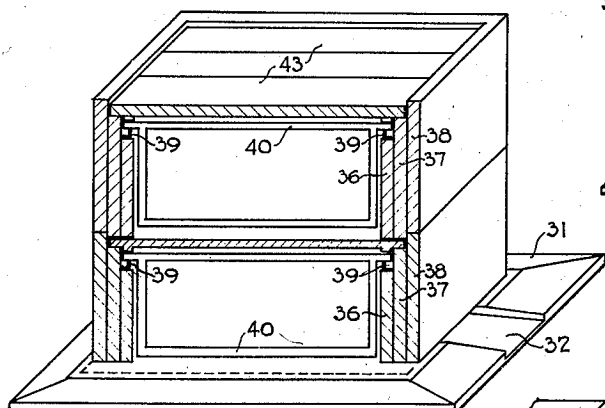


FIG. 7

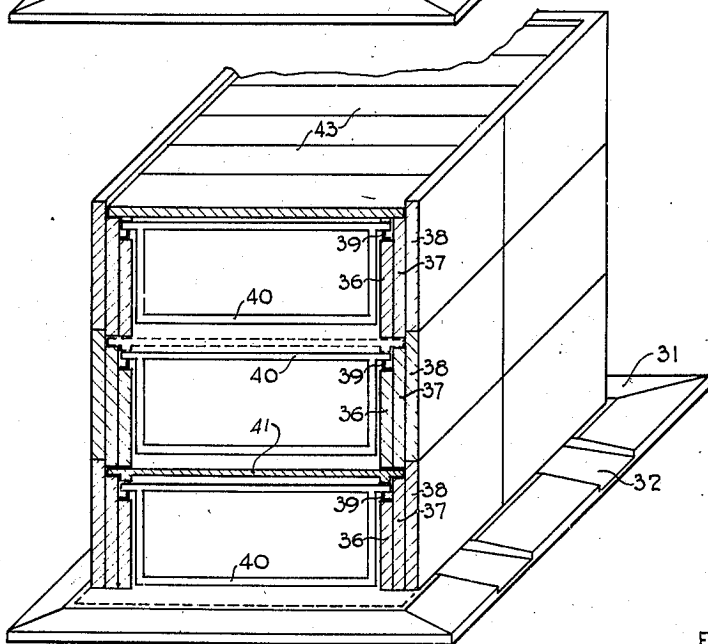


FIG. 8

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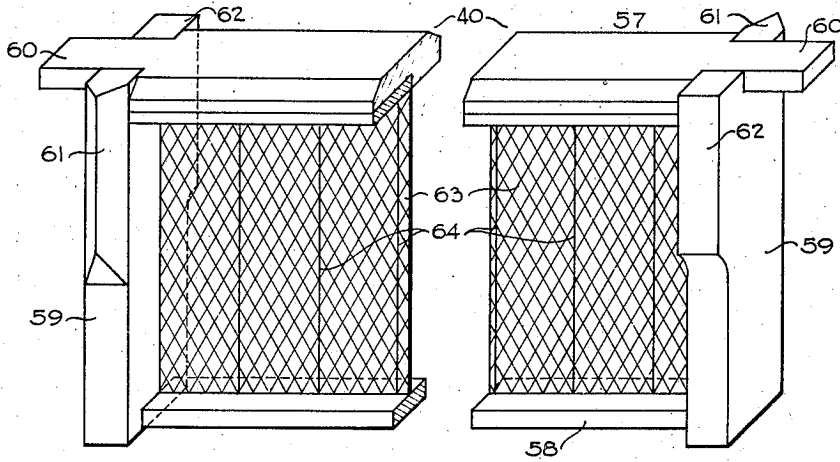


FIG. 15

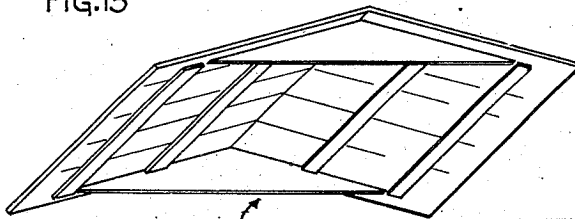


FIG. 5

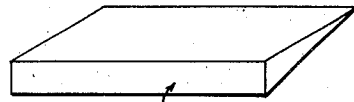


FIG. 6

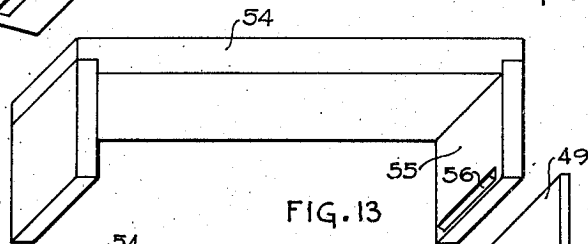


FIG. 13

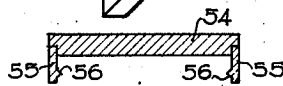


FIG. 14

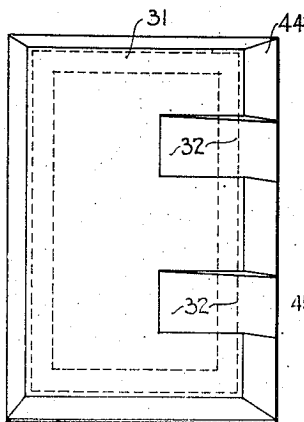


FIG. 9

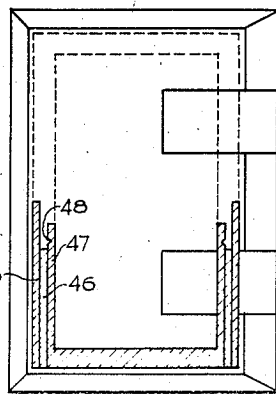


FIG. 10

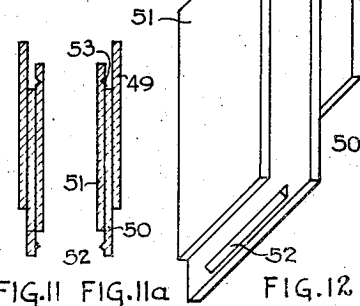


FIG. 11 FIG. 11a

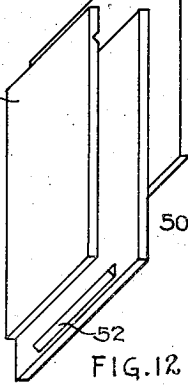


FIG. 12

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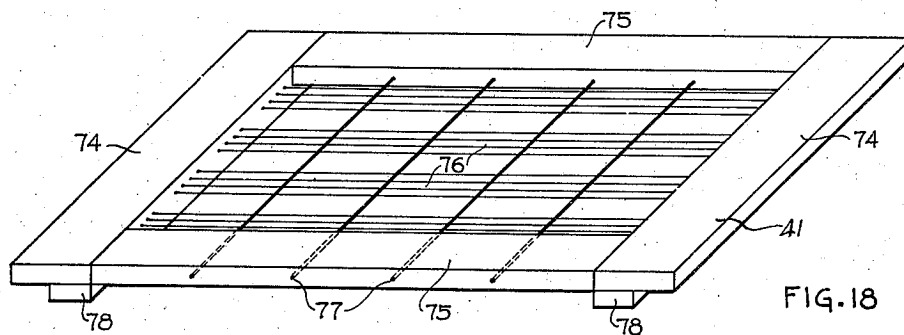


FIG. 18

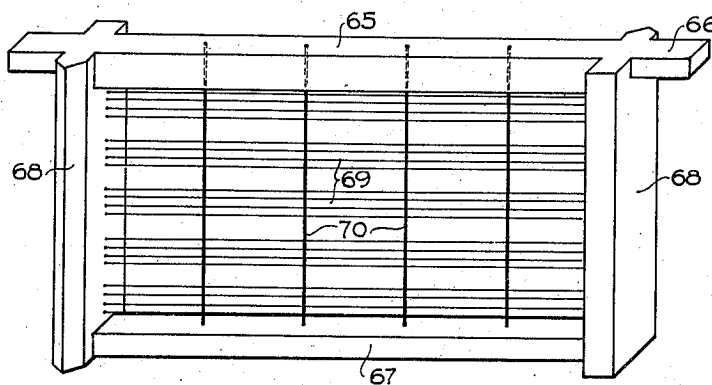


FIG. 16

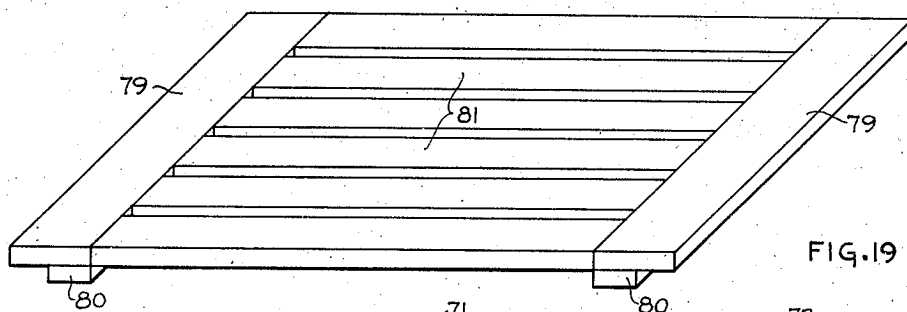


FIG. 19

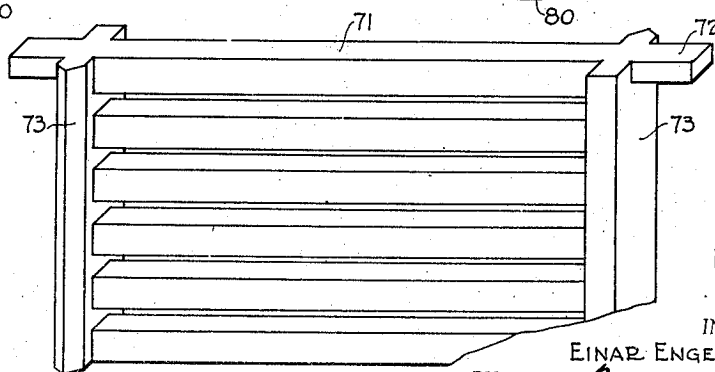


FIG. 17

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# UNITED STATES PATENT OFFICE

2,103,066

## BEEHIVE

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of one-half to Eric Gross, New York, N. Y.

Application April 25, 1933, Serial No. 667,800

3 Claims. (Cl. 6—1)

This invention relates to beehives, and has for its object to provide a beehive that may be enlarged as well in width as in height, by adding to the basic or original beehive any desired number of further sections, or compartments; the latter being built up by the assembling of members especially made as unified constructional elements, which are adapted to be hooked up to the already present parts of the beehive. Thus through such arrangement, it is possible to produce as early as the month of February a brood without cooling the community, and through the unity of several stories and extensions combined into one, it is possible to get double the amount of honey, that was got in the old style. Through the removable side walls, the cost of production has been brought down by the elimination of the longitudinal walls used at present; and further, it is now possible to provide several communities, including one queen for every community, in the same hive; all advantages of great importance.

In order to carry out these objects of the invention, I build up the beehive by a basic plate, a preferably rectangular housing of vertical walls, of which one side wall may be taken off or hooked on to the neighboring walls of this frame, a roof detachably united with or placed on top of this vertical housing, and insets to be placed removably into the housing, which insets consist mainly of a number of vertical frames hung up side by side within the housing, and in a false roof placed on top of the suspended frames. If the beehive is to be enlarged as to its width, then the aforesaid one vertical sidewall of the housing is removed and each neighboring sidewall is elongated by the addition of an interlocking wall unit or several such units, thereupon the closing end wall is again added, the necessary number of inset frames are hung up within the new built compartment, and the whole new built extension is covered by a corresponding additional roofing. An enlargement of the beehive as to its height is carried out in a similar way by removing the roof, placing on the old set of side walls an interlocking upper housing story, and hanging up therein the needed number of inset frames, and next putting on top the roof to close the beehive again. It is further advisable, although not absolutely necessary, to separate the different compartments by partitions and to separate the different stories by inserted false roofs or ceilings, the shape and construction of these partitions and false roofs or ceilings being chosen differently for the summer time and for the winter time. Furthermore, it is an important feature of the invention

that the dimensions of the inset frames, of the partitions and of the false roofs or ceilings are such that between them and the surrounding housing there is left just enough passage space for the honey-collecting working bees to pass through within the whole beehive, whereas the idle drones, which are of bigger size, cannot pass through these different passages.

In the drawings, forming part of this specification, and in which similar characters of reference indicate corresponding parts:—

Figures 1 to 4 show in four analogous perspective views the stepwise enlargement of a beehive according to the present invention by the addition of new compartments;

Figure 5 shows in a perspective view, seen from below, a two-winged roof, adapted to cover one single compartment or two neighboring compartments;

Figure 6 shows in a perspective view from above a one-winged roof for a laterally adjoining compartment;

Figures 7 and 8 show perspective views of a two-storied and of a three-storied beehive respectively, with the front wall removed in order to show the interior structure;

Figures 9 to 14 show the erection of a beehive housing with one lateral enlargement compartment; Figures 9 and 10 being plan views of the baseplate and of the same baseplate with three walls erected on it; the Figures 11, 11a and 12 being horizontal cross-sections and a perspective view respectively of an enlargement unit for the side walls, the Figures 13 and 14 being a horizontal cross-section and a perspective view of the rear end-wall;

Figure 15 shows a perspective view of a honey-carrying frame;

Figures 16 and 17 show in perspective view two kinds of vertical partition walls to be inserted between two neighboring compartments;

Figures 18 and 19 show in perspective views two kinds of horizontal ceilings or false roofs, to separate two vertical consecutive compartments.

The same reference numbers in the different figures indicate always the same or analogous parts in the construction.

In the shown illustrations of my new and improved enlargeable beehive, a rectangular base plate of suitable length is provided with slightly slanting ascents cut into it from one of its longer sides, so as to form slots between the bottom of these ascending grooves and the vertical housing placed on the baseplate. Figure 1 shows a housing, which forms one single compartment

33; Figures 2 and 3 show housing of two compartments 33, 33a; Figure 4 shows a housing of three lower compartments 33, 33a, 33b; Figures 3 and 4 show on top of the lower compartments additional upper compartments 33' and 33a'. The housings are covered by a detachable two-winged roof 34 and 34', respectively for a single and a double compartment, preferably such as shown in Figure 5 in a perspective view seen from the lower side, and additional lower compartments are covered by one-winged slanting roofs 35, as shown in the Figure 6.

Figure 7 shows the interior of a two-story beehive, and Figure 8 the interior of a three story beehive, with the longer front end-walls of the compartments removed. The remaining vertical sidewalls of the compartments are built each one by uniting three wooden planks 36, 37, 38 placed side by side so as to form three steps towards the top. Metallic bars 39 of angular cross-section are fastened on the lowest ones of the three steps, which are formed by the innermost planks 36; and on these bars 39 are supported the vertical honey-containing frames 40 and the vertical partitions which separate the neighboring compartments. On the middle steps of the side walls, which are formed by the middle planks 37, are rested the horizontal ceiling 41, which separates always two vertically consecutive compartments, and on the middle steps in the walls of the uppermost story are rested the false-roofing planks 43.

Figures 9 to 14 show the constructional details of the parts used for building up a horizontal enlargement of the housing of the beehive. Figure 9 is a plan view of the baseplate 31, but held in a very slightly perspective position, in order to show more clearly the slanting part 44 and the slanting ascents 32 at the one longitudinal side of the baseplate on which ascents the bees will creep into the beehive.

The dotted lines in Figure 9 indicate the place on which the vertical walls of the housing are to be erected. Figure 10 shows three walls of the first compartment 33 already set up, and it shows further that the two fixed or stationary side walls consist each of the before said three wooden planks of different length, the outermost planks 45 being the longest, the middle planks 46 being the shortest, and the innermost planks 47 being of medium length but having each a vertical triangular groove 48 adjoining the end of the middle plank 46. In the Figures 11 and 11a respectively, are shown horizontal cross-sections, and in Figure 14 is shown a perspective view of the prolongation-units of the side walls of the housing. Each such prolongation unit is in a way, similar to the stationary part of the side wall, built up by gluing together or otherwise uniting three wooden boards 49, 50, 51 in such manner, that at the one end of this unit, the middle plank 50 extends over the two other planks, and this extension is provided at its end with a vertical triangular ledge 52, which fits into the before said vertical triangular groove 48 of the already erected stationary part of the housing. The other end of the prolongation unit is shaped in exactly the same manner, as it had been explained above with reference to the ends of the sidewalls of the stationary part of the housing, that means so as to form a vertical groove with a lateral triangular enlargement at its inner end 53. Therefore the prolongation units can be simply hooked into the already erected part of the housing sidewalls,

and again some more prolongation-units may be added thereto, to enlarge the beehive laterally as much as is desired. All the prolongation units are further likewise shaped to form three vertical steps, which will come in line with the corresponding steps on the stationary side walls, as explained before. The vertical end-wall 54 for closing the last compartment, as shown in Figure 12 in horizontal cross-section, and in Figure 13 in a perspective view, is provided at its ends with lateral arms 55 with a vertical triangular ledge 56 on each arm, so that by the means of these arms and ledges the end-wall can be simply hooked into the rest of the housing so as to close it, as this will be evident from contemplation of the Figures 9 to 14. In multistoried beehives the upper stories are built up in exactly the same manner, as has been described here in detail with reference to the ground-floor story.

Figure 15 shows in perspective the preferred form of the honey carrying frames 40, hung up in the different compartments. These wooden frames consist each of a horizontal top bar 57 and a horizontal bottom bar 58, and two vertical side bars 59, these four bars being firmly joined together in a manner well known to men of the wood-working craft. The top bar 57 has endwise prolongation ears 60, by means of which the frame is suspended on the angular metallic rails 39 shown in the Figures 7 and 8. In order to keep the frames correctly distanced from each other, the upper part, about  $\frac{1}{3}$  or one-half of each vertical side bar, is somewhat broadened, the broadening having at the one side of each side bar the form of a wedged ledge 61, whereas the broadening 62 at the other side is formed flat, and the different broadenings on each frame are arranged crosswise, so that in the assembled beehive always one wedged ledge 61 will meet a flat broadening 62, which arrangement facilitates a later separation of the honeyfilled frames.

At the longitudinal axis of the top bar 57 is suspended a thin sheet 63 of wax, which is all over embossed with hexagonal grooves, starting thus regular honeycombs, which will be completed by the working bees. A number of thin wires 64 are preferably embedded into wax-sheet 63 to give to it greater firmness, because it is merely suspended from the top bar 57. The dimensions of and distances between the different parts are chosen such, that the honey-carrying working bees which are the smaller ones, can creep freely between the lower parts of the side bars 59 of the frames and round the ends of the wax-sheet 63, whereas the drones, which are of larger size, cannot creep through.

Figures 16 and 17 show in perspective views two preferred forms of the vertical partitions to be used for separating neighboring compartments. According to the construction of Figure 16 a rectangular wooden frame is used consisting of a top bar 65 with lateral suspension ears 66, a bottom bar 67 and two side bars 68, each one of these side bars being provided at the one side with a wedge-shaped broadening and at the other side with a flat broadening, which broadenings are similar to the side bar broadenings in the honey carrying frames, but in the partition forming frames they will preferably extend over the whole length of the side bars. The frame of the partition is filled by groups of thin wires 69 extending between the side bars with somewhat greater distances between the different groups, sufficiently large for the working bees to creep through, and by a few somewhat thicker wires 70 extending

from the top bar 65 to the bottom bar 67, which thicker wires 70 serve for keeping the thin wires 69 in their right place. The other kind of partition as shown in Figure 17, is a kind of wooden lattice, the uppermost horizontal bar 71 having again lateral extensions or suspension ears 72 and the two vertical side bars 73 being wedge-like shaped at the one side and flat at the other side, similarly as in the before described frames.

10 The partitions according to Figure 16 give more air circulation between the different compartments, as it is needed for the bees working in the summer time; the partitions according to Figure 17 however keep the heat more together within

15 each compartment in the winter time, while still admitting a sufficient amount of fresh air to the bees, which are at rest.

Figures 18 and 19 show in perspective views two constructions for the horizontal floorings or ceilings which separate always two vertically consecutive compartments. The construction of the Figure 18 is a rectangular frame similar to that of Figure 16, which frame consists of two pairs of wooden bars 74, 75, groups of thin wires 76

25 extending between the bars 74 of the one group, and a few thicker wires 77 extending between the other two wooden bars 75, so as to support the thinner wires 76 and to hold them at their proper places. The bars 74 rest with their outer edges

30 on the middle steps of the vertical beehive housing, whereas the inner edges of these bars 74 are reinforced by ledges 78, which at the same time serve to hold the suspension ears 60 of the honey frames firmly down on the rails 39 carrying these

35 ears. This kind of flooring which separates the first compartment 33 from the next higher one gives likewise plenty of air circulation and passage place for the bees working in the summer time. The construction of Figure 19 which is a more

40 closed wooden grating for the winter time, contains likewise side bars 79 which rest with their outer edges on the middle steps in the beehive housing walls, and which, with their lower reinforcing ledges 80, bear on the suspension ears of

45 the honey frames below them, whereas the wooden planks 81, extending between the two side bars 79, leave only comparatively narrow gaps between them. Above the top story of the beehive

50 figures, may be dispensed with, and substituted by the false roofing 43, as shown in the Figure 8.

I claim:—

1. A beehive comprising a baseplate, a rectangular four-walled housing, a detachable roof and removable vertical inset-frames suspended within the housing to form partitions and receive honey, respectively, the vertical partition-forming frames consisting each of a rectangular wooden frame, 5 having an upper end and a lower horizontal bar, two vertical side bars, lateral suspension ears in elongation of the upper horizontal bar, groups of thin wires extending between the two lateral side 10 bars, heavier wires at greater distances from one another extending from the upper horizontal bar to the lower horizontal bar, and distancing wedge shaped ledges and flat thickenings at the two sides of the vertical side bars to keep the partition 15 forming frames in proper distance from the neighboring suspension frames.

2. In a multistoried beehive, detachable, horizontal ceilings to separate two vertically consecutive compartments of the latter, consisting each of 20 a rectangular frame of two pairs of bars, one pair of these opposite bars being rested with their outer rims on horizontal shoulders, provided within the beehive housing at two opposite sidewalls of the said housing, re-inforcing ledges at the 25 lower sides of the inner rims of the last mentioned pair of bars, the said ledges being adapted to bear on the upper ends of vertical suspension frames arranged in the compartment below the ceiling frame, groups of thin wires extending be- 30 tween the aforesaid rested bars laterally disposed, and thicker wires at greater distance from one another extended across the thin wires between the other pair of the frame forming bars.

3. In a beehive, a baseplate, an enlargeable rec- 35 tangular four-walled housing, a detachable roof, and removable rectangular vertical inset-frames within the housing, horizontal shoulders formed along two opposite side walls within the housing, rails of angular cross section extending along said 40 shoulders, lateral elongated ears on the ends of the upper portion of the inset-frames for suspending the frames by said ears on the rails, and separating wedge-shaped portions and flat portions at opposite sides of the side-bars of the inset- 45 frames to keep the latter at proper distances from one another, groups of thin wires extending between the bars laterally disposed, and thicker wires at greater distance from one another extended across the thin wires between the mem- 50 bers of the frame forming bars.

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