July 14, 1942. L. L. MALLARD 2,289,849

MACHINE FOR ASSEMBLING GRID PARTITIONS

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Fig. 1.

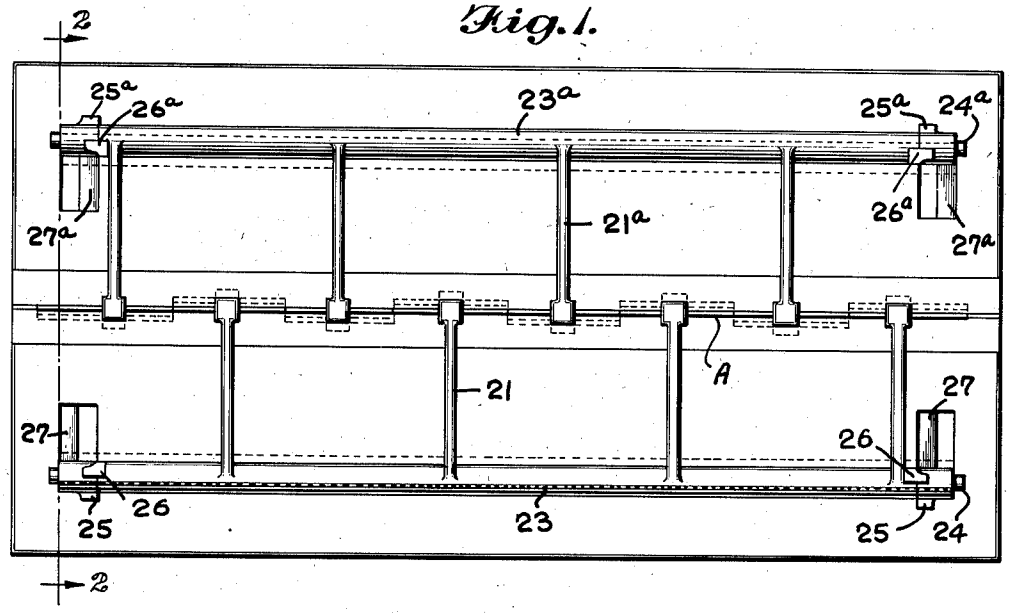
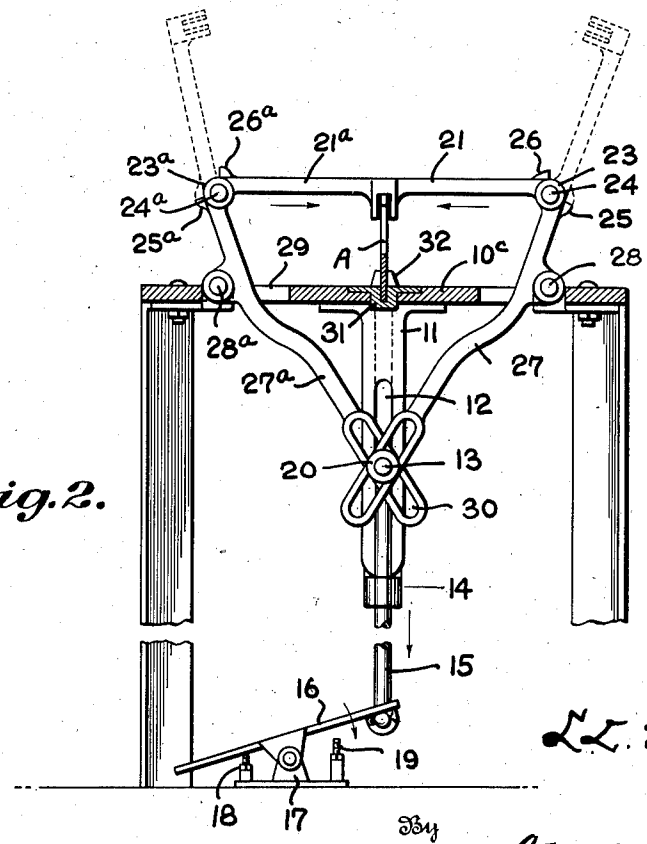


Fig. 2.



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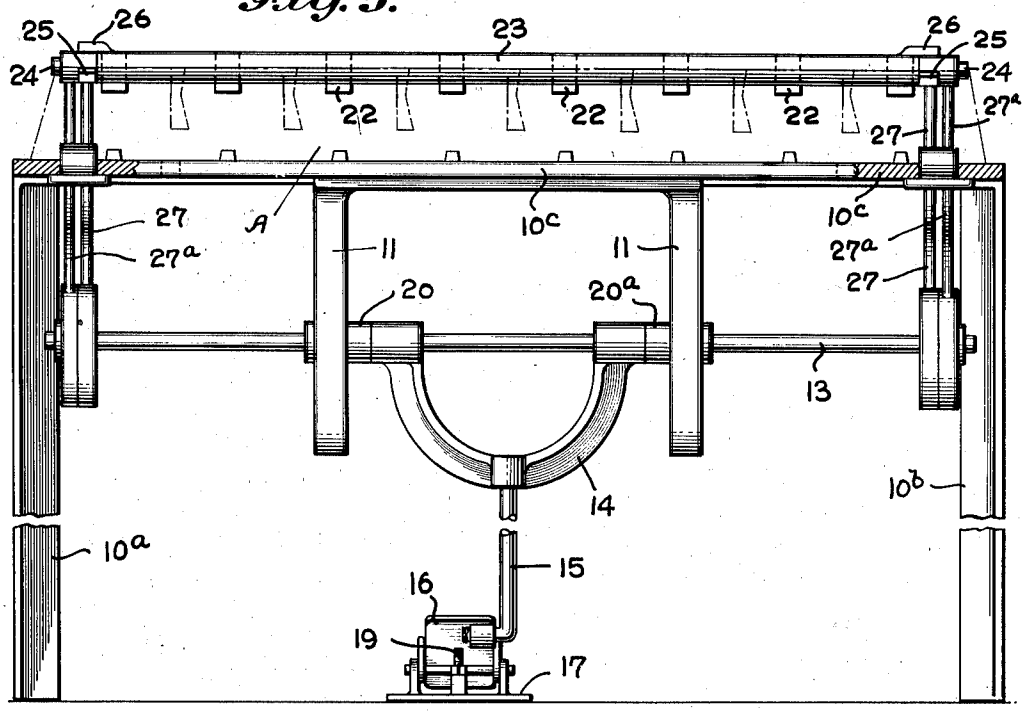
Attorney

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Fig. 3.



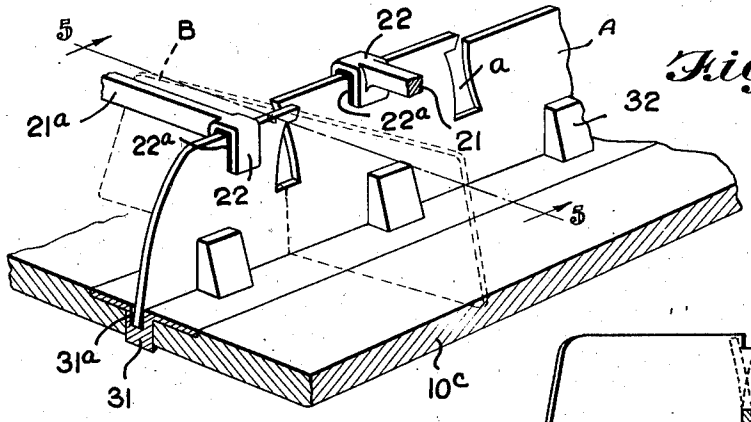


Fig. 4.

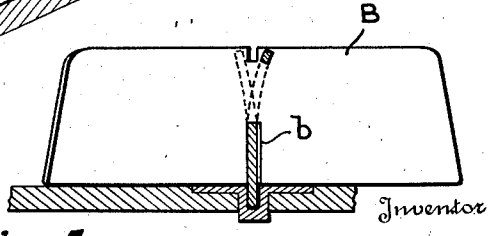


Fig. 5.

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MACHINE FOR ASSEMBLING GRID PARTITIONS

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Application November 4, 1940, Serial No. 364,300

7 Claims. (Cl. 29—84)

This invention relates to a machine for assembling grid members and the like, and has been devised particularly for assembling longitudinal and lateral ice cube tray partitions of that type having interengaging slots which in one of the partitions are closed or substantially closed at the lower edge of the partition, such for example as the partitions for ice cube trays illustrated in my copending application, Serial No. 305,552, filed November 21, 1939. Grid members or partitions of this type are shown in Figs. 4 and 5, the longitudinal partition being indicated at A and one of the transverse partitions at B. The longitudinal partition is formed with slots *a* which are closed at the lower edge of the slot (the partitions being inverted in Figs. 4 and 5) although the metal at this point is cut through or separated, permitting the metal between the slots to flex laterally of the partition. The transverse partition B is formed with an open slot *b* which is inserted into the slot *a* of the longitudinal partition and straddles the metal of the said latter partition above this slot. These grid partitions are generally formed of sheet metal such as aluminum alloy which has sufficient inherent flexibility to permit limited flexing without imparting a permanent bend or set to the metal.

The assembling of these longitudinal and transverse partitions presents a problem, since it is difficult for one individual or a single workman to do the assembling operation in the time required to produce a grid unit which may be sold competitively in the open market; and it is an object of the present invention to provide a machine which will expedite this assembling operation.

While the machine is primarily adapted for assembling grid members or partitions for ice cube trays, it obviously may be used for assembling other parts having characteristics of a similar nature.

In the drawings:

Fig. 1 is a top plan view of a machine embodying the features of the invention;

Fig. 2 is a sectional view taken substantially on the line 2—2, Fig. 1;

Fig. 3 is a view in rear elevation of the machine;

Fig. 4 is an enlarged fragmentary perspective of the assembling table showing the transverse grid partitions being assembled with respect to the central longitudinal partition; and

Fig. 5 is a view taken substantially on the line 5—5, Fig. 4.

Referring to the drawings in detail, the machine comprises a main supporting frame including uprights 10*a* and 10*b* and an assembling table 10*c* supported by said uprights.

Secured to the underside of the table and depending therefrom is a pair of guide brackets 11 of similar construction, each of which is formed with an elongated substantially vertical guide slot 12, note particularly Fig. 2. A shaft 13 projects through the transversely aligned slots 12 and at an intermediate point is supported or carried by a yoke 14 having connected thereto a link rod 15 which extends downwardly and at its lower end is pivotally connected to a foot treadle 16, the latter being mounted on a supporting bracket 17 having adjustable contacts 18 and 19 at opposite ends thereof adapted to engage the treadle and limit its rocking movement and thus limit the movement of the parts actuated by the treadle. At the point where the shaft projects through the aligned slots 12, said shaft is provided with friction or bearing rollers 20 and 20*a*.

The reference numerals 21 and 21*a* indicate gripping arms of similar construction, each having a jaw 22 on the outer end thereof. These jaws are preferably lined with friction and cushioning material 22*a* such as rubber, to hold the jaws against displacement and to prevent marring of the metal gripped thereby. The arms 21 and 21*a* are arranged in staggered relation longitudinally of the machine, note Fig. 1, and are adapted to engage the bottom edge of the longitudinal partition and distort or deflect portions of the latter between the slots in opposite directions as indicated in Fig. 4. The arms 21 and 21*a* are carried by sleeves 23 and 23*a* which are rotatable about shafts 24 and 24*a*, rearward or backward rotation of the said arms being limited by stops 25 and 25*a* and forward and downward rotation being limited by stops 26 and 26*a*.

The shafts 24 and 24*a* are supported at opposite ends by actuating arms 27 and 27*a*, there being a pair of these arms at each end of the machine rotatably mounted or fulcrumed on stub shafts 28 and 28*a* supported by the table 10*c* the latter being slotted at 29 to accommodate mounting and movement of the arms. At their lower ends the arms 27, 27*a* are formed with slots 30 through which the opposite ends of the shaft 13 project.

The table 10*c* is provided with a grid partition support 31 having therein a slot 31*a* adapted to receive the top edge of a longitudinal grid par-

tition; and at spaced intervals along the member 31 are braces 32 to lend stability to the grid partition during the assembling operation, note Fig. 4.

The machine operates as follows:

A longitudinal grid partition A is inserted in the slot 31*a* between the braces 32, the arms 21 and 21*a* at this time being swung back manually or by hand to the dotted line position shown in Fig. 2. The arms 21, 21*a* are then swung down to grip the partition A in a manner shown in Fig. 4, the arms 21 engaging alternate portions of the partition between the slots *a* and the arms 21*a* engaging the portions between those engaged by the arms 21, note also Fig. 1. In the position of Fig. 2 the longitudinal partition has been gripped ready for the spreading operation. The foot treadle 16 is then operated to pull the shaft 13 downwardly, whereupon the arms 21 and 21*a* are pushed inwardly, flexing and spreading the longitudinal partition A and permitting the transverse partitions B to be readily inserted in the slots *a*. The foot treadle is then worked in the opposite direction and the shaft 13 raised, the inherent flexibility of the metal or material of which the longitudinal partition A is made causing the said partition to assume its original shape and the arms 21 and 21*a* returning to the position shown in Figs. 1 and 2. If the material of the longitudinal partition A is not inherently resilient or does not tend to assume its original shape, then the arms 21, 21*a* may be returned forcibly to their original position to thereby bend the alternately flexed or bent portions of said partition back to its original shape.

The adjustable stops 18 and 19 for treadle 16 provide means for accurately determining or adjusting the limit of flexing movement of the arms 21, 21*a* as well as providing a means for aligning the jaw 22 carried by said arms.

It will be understood that certain changes in construction and design may be made to adapt the machine to varying conditions of use without departing from the spirit or scope of the invention as defined by the appended claims.

What is claimed is:

1. In a machine for assembling longitudinal and transverse grid partitions for ice cube trays of that type wherein a main longitudinal central partition is provided with slots substantially closed at the one edge of the partition, an assembling table having an elongated groove therein to receive the one edge of the longitudinal partition and support the latter edgewise in inverted position, a plurality of arms arranged in staggered opposed alternate sets, each arm having a jaw on the end thereof adapted to grip the free slotted edge of the longitudinal partition, levers operatively connected to said arms, means for actuating said levers to move the alternate sets of said arms in counter directions to spread alternate portions of the longitudinal partition between the slots and open the latter to permit insertion of transverse partitions.

2. In a machine for assembling longitudinal and transverse grid partitions for ice tube trays of that type wherein a longitudinal partition is provided with slots which are substantially closed at the lower edge of the partition but permit flexing of the latter to open the slots to receive the transverse partitions, an assembling table having means for supporting a longitudinal partition edgewise in inverted position, a series of alternately arranged oppositely disposed sets of arms having jaws on the ends thereof adapted to grip the slotted edge of the partition in spaced relation therealong between the slots, sleeve members pivotally mounting said arms whereby each set may be swung as a unit into and from gripping relation with respect to the longitudinal partition, levers operatively connected to said sleeve members, said levers being fulcrumed at an intermediate point, means connected to said levers whereby the latter may be actuated to move the sets of arms in directions counter to one another to flex the longitudinal partition.

3. In a machine for assembling parts such as longitudinal and transverse grid partitions for ice cube trays of that type wherein a longitudinal partition is provided with slots which are substantially closed at one edge of the partition but permit flexing of the latter to open the slots to receive the transverse partitions, an assembling table having means for supporting a longitudinal partition edgewise with the slotted edge exposed, a series of alternately arranged oppositely disposed sets of arms having jaws on the ends thereof adapted to grip the slotted edge of the partition in spaced relation therealong between the slots, sleeves rigidly connecting the arms of each set to one another for manual rotation to jaw-gripping and releasing position, shafts on which said sleeves are rotatably mounted, levers supporting said shafts, said levers being fulcrumed at an intermediate point and at their lower ends converging in overlapping relation at an angle and being provided with elongated slots in registration one with the other, an operating shaft projecting through said slots, and means for raising and lowering said operating shaft whereby said levers are actuated or rocked to move the sets of arms in directions counter to one another to thereby flex the slotted portions of said longitudinal partition and permit insertion of transverse partitions.

4. In a machine for assembling longitudinal and transverse grid partitions for ice cube trays of that type wherein a longitudinal partition is provided with slots which are substantially closed at the one edge of the partition but permit flexing of the latter to open the slots to receive the transverse partitions, a main supporting frame including an assembling table having means thereon for supporting a longitudinal partition edgewise in inverted position, a series of alternately arranged oppositely disposed sets of arms each having a jaw on the end thereof adapted to grip the slotted edge of the longitudinal partition in spaced relation therealong between the slots, sleeves rigidly connecting the arms of each set, shafts rotatably mounting said sleeves to permit the sets of arms to be manually rotated to move the jaws into and from gripping position, rocking levers pivotally supporting said shafts, said levers being fulcrumed or pivoted at an intermediate point and at their lower ends converging at an angle in overlapping relation and being provided with elongated slots in registration one with the other, a main operating shaft projecting at opposite ends through said slots, means for raising and lowering said shaft to in turn rock said levers and move said arms in directions counter to one another to thereby flex alternate portions of said longitudinal partition, and guide means for said shaft restraining the latter to a substantially vertical path.

5. In a machine for assembling parts such as longitudinal and transverse grid partitions for ice cube trays of that type wherein a longitudinal partition is provided with slots which are sub-

stantially closed at one edge of the partition but permit flexing of the latter to open the slots to receive the transverse partitions, a series of alternately arranged oppositely disposed arms having jaws on the ends thereof adapted to grip the slotted edge of the partition in spaced relation therealong, means for actuating said arms in directions counter to one another to oppositely flex or bend portions of the partition along the length of the latter, and anti-friction and cushioning means for said jaws to hold the latter in gripping relation to the edge of the partition and prevent mutilation of the latter.

6. In a machine for assembling parts such as longitudinal and transverse grid partitions for ice cube trays of that type wherein a longitudinal partition is provided with slots which are substantially closed at one edge of the partition but permit flexing of the latter to open the slots to receive the transverse partitions, a series of alternately arranged oppositely disposed arms having jaws on the ends thereof adapted to grip the slotted edge of the partition in spaced relation therealong, means for actuating said arms in directions counter to one another to oppositely flex or bend portions of the partition along the length of the latter, and adjustable means for limiting the movement of said arms.

7. In a machine for assembling longitudinal and transverse grid partitions for ice cube trays of that type wherein a main longitudinal central partition is provided with slots substantially closed at the one edge of the partition, a plurality of arms arranged in staggered opposed alternate sets, each arm having a jaw on the end thereof adapted to grip the free slotted edge of the longitudinal partition, levers operatively connected to said arms, means for actuating said levers to move the alternate sets of said arms in counter directions to spread alternate portions of the longitudinal partition between the slots and open the latter to permit insertion of transverse partitions.

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