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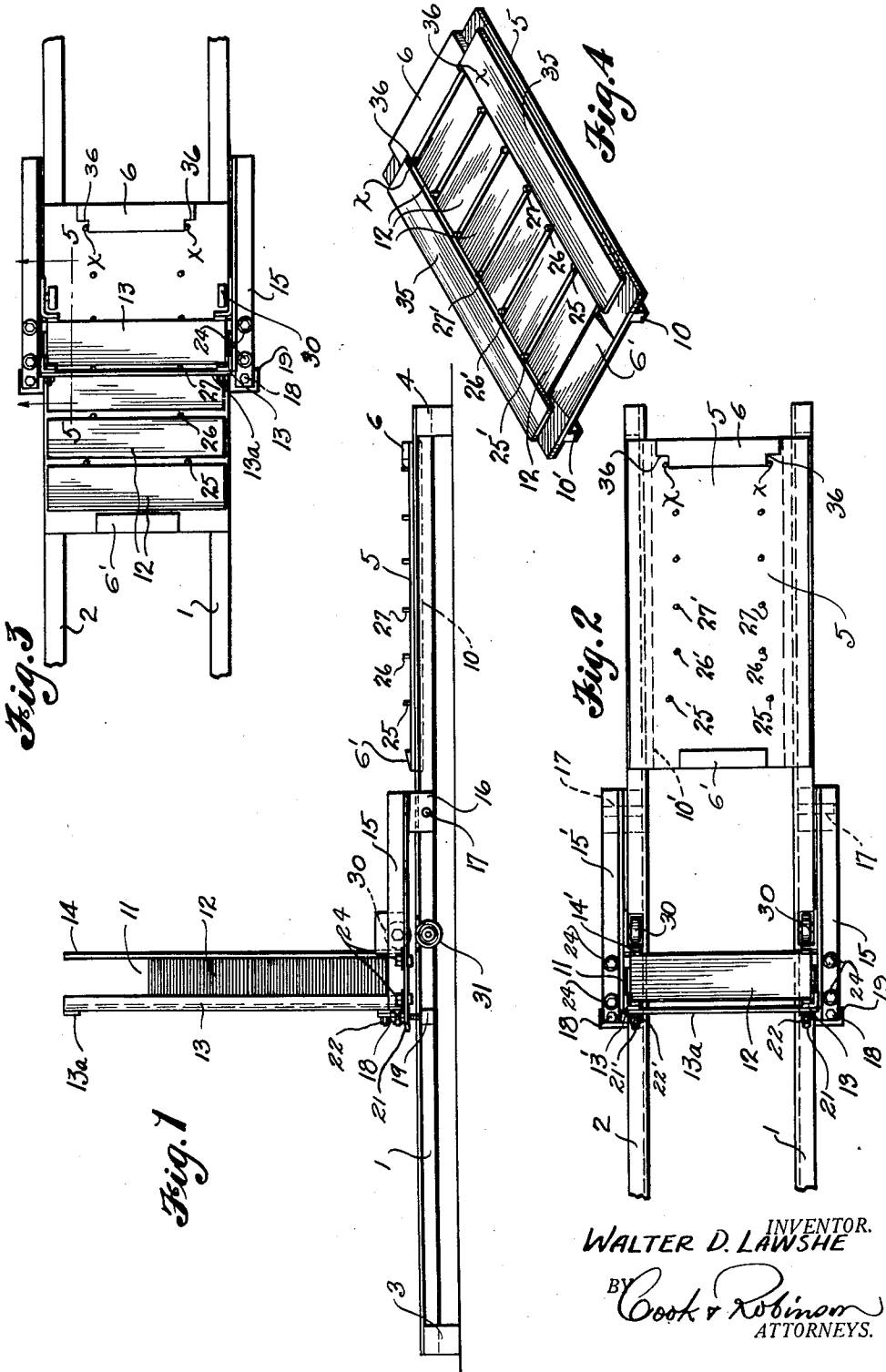
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2,135,755

SLAT ASSEMBLING DEVICE

Filed Feb. 8, 1937

2 Sheets-Sheet 1



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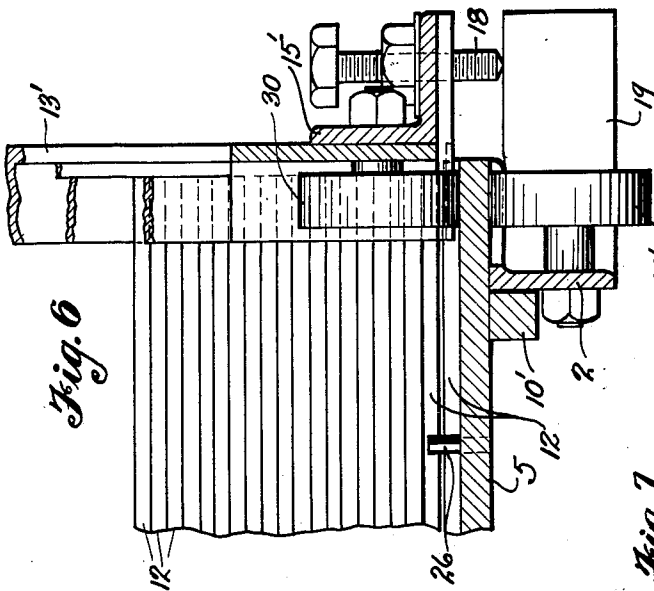
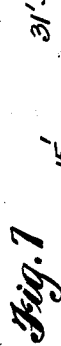
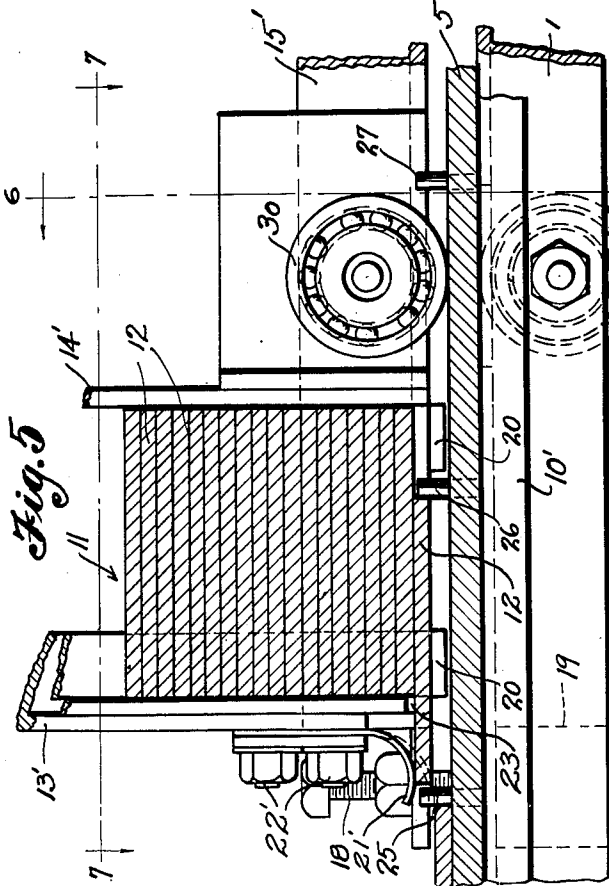
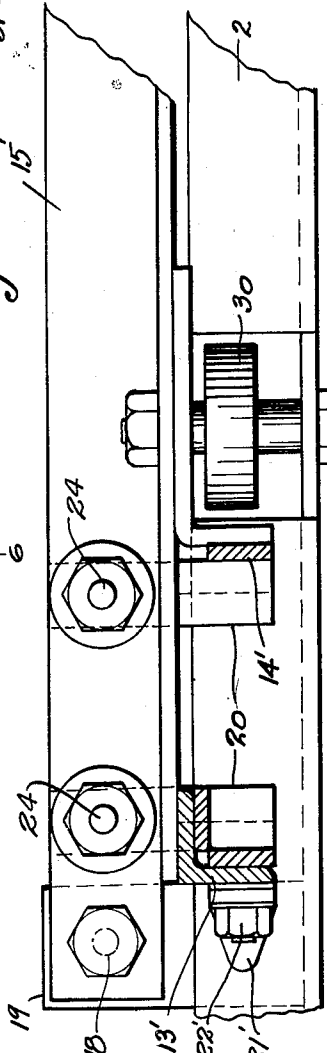
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,135,755

SLAT ASSEMBLING DEVICE

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5 Claims. (Cl. 144—245)

This invention relates to a slat assembling means for use in connection with the manufacturing of light weight crates or boxes. More particularly, it has reference to a means whereby thin wooden slats or the like may be extracted successively from the lower end of a storage hopper, and deposited evenly and in spaced, parallel relation on an assembly table for ready assembly with and attachment to cleats or rails, which completes the section or panel ready for use as a wall of a crate or box.

Explanatory to the present invention, it will here be stated that in present-day industry many crates of a certain kind, for which the present device is intended, are used for the packing and shipping of goods or merchandise. Such crates must necessarily be light in weight, yet durable in construction. A satisfactory crate, now extensively used, is one in which the walls are made up of thin wooden slats that are arranged in parallel relation, and more or less spaced apart, and secured at their opposite ends to cross cleats whereby the wall section is unified. The various sections of a box or crate are fitted together and are united in such manner as to form a crate or box of the desired strength. The mode of connecting the slats of the walls to their respective cleats may be either by stitching, nailing or gluing, and the wall sections likewise may be united in various ways, but in the present instance, it is anticipated that the slats will be joined to their cleats by gluing, and that the box sections or walls shall be nailed together and may also be reinforced by straps or binding wires. However, the mode of connection is of no particular import in the present invention.

It will also be explained that, heretofore, it has been common practice in the manufacture of crates or boxes of this character to lay the slats in place by hand, then to lay the cross cleats in place thereon by hand, and finally to place the assembled slats and cleats in a stitcher or nailing machine, or even to apply glue to the parts by hand methods to attach them together. This previous method of assembly which was done substantially in its entirety by hand operation, is comparatively slow, and the spacing of the slats on the cleats, when done by eye, may be, and generally is, uneven, and is unsightly in a finished crate. Also, it is undesirable by reason of causing an unevenness which makes a final accurate assembly of the sections difficult.

In view of the above and other objectionable features that are incident to manual assembly of the slats and cleats, it has been an object of this

invention to provide means of a mechanical nature whereby the thin wooden slats, as used in the manufacture of the box or crate sections, may be readily and rapidly assembled on a table or plate in accurate spacing, and in accurate end alignment ready for placement of the connecting cleats across their ends.

More specifically stated, the present invention resides in the provision of an assembly slide in the form of a flat plate or table, that is adapted to be moved along a guideway and to be passed directly beneath the lower end of a hopper in which the thin slats are contained in stacked relation, and upon which table extractor studs or the like are arranged to successively engage and extract the slats from the lower end of the hopper as the slide is advanced beneath it, thereby to locate the slats in a desired parallel relationship, and in a desired spacing on the plate that may be varied in accordance with the spacing of the extractor devices on the table.

It is also an object of this invention to so arrange the studs or extractor devices that they may be utilized as aligning stops for the assembly of the side cleats with the slats, thus to aid in obtaining that accuracy in the placement of the cleats which is necessary to avoid the unevenness that is detrimental to the final accurate assembly of sections of a box or crate.

In accomplishing the above and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings wherein—

Fig. 1 is a side view of a slat assembling machine embodying the present invention, showing the slide table in position in the guideway ready to be advanced beneath the slat hopper.

Fig. 2 is a plan view of the device with the parts in position illustrated in Fig. 1.

Fig. 3 is a plan view illustrating the depositing of the slats on the slide table incident to the latter being advanced from right to left beneath the hopper.

Fig. 4 is a perspective view showing the slats arranged upon the slide table, and the cleats applied across the ends of the slats ready for their being placed under pressure, if glued, or for stitching.

Fig. 5 is an enlarged, cross sectional view on the line 5—5 in Fig. 3, particularly illustrating the construction of the lower end of the hopper and the extraction of a slat therefrom.

Fig. 6 is a cross sectional view on the line 6—6 in Fig. 5.

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Fig. 7 is a horizontal section taken on the line 7-7 in Fig. 5, particularly illustrating the hopper construction.

Referring more in detail to the drawings:

5 The present device, in a preferred form of construction, comprises a guideway comprising two horizontal and parallel rails 1 and 2, connected across their opposite ends, respectively by bars 3 and 4, and thereby held in a definite 10 spaced relation. These two spaced rails are in the same horizontal plane and together form a trackway along which a slide table 5 is movable. The slide table 5 is of rectangular form and preferably would comprise a plate of wood, or 15 other suitable material, and of a length sufficient that the desired number of slats for a box section could be assembled thereon, and its width would be such as to overlap the rails 1 and 2 for support thereon. At the trailing end of the table, 20 considering its movement for the assembly of slats thereon, there is a bar 6 fixed transversely thereon. This may be used as a hand hold for movement of the table beneath the hopper, but primarily it is intended to be used in the alining 25 of the ends of the cleats as will be presently explained. Also, along the leading edge of the slide table is a bar 6', fixed upon the table to act as a retainer for the first slat to be extracted from the hopper 11. It should be noted that this 30 bar is lower, or thinner than the studs 25, etc., and also thinner than the slats themselves, and that it tapers forwardly to edge at the edge of the slide table 5. This provides a retainer bar, which of necessity is such height that it will not 35 extract a slat from hopper 11, nor in any way interfere with their extraction. In order that the table may be guided accurately in its travel along the guideway, it is provided on its under side with guide ribs 10 and 10'. These fit between the rails 1 and 2 and hold the table accurately in alignment on the track during its 40 movement.

Located about mid-way between the opposite ends of the track and supported on the rails 1 45 and 2, is a hopper for the slats. This hopper is designated in its entirety, by reference numeral 11, and the wooden slats which are contained in stacked relation therein are designated by numeral 12, and these slats would fit the hopper with a looseness that permits easy vertical movement but no appreciable misalignment laterally. 50

The hopper, as here illustrated, comprises the forward corner angle posts 13 and 13' at opposite sides of the hopper, and supporting guides or 55 posts 14-14' at the rearward opposite corners. The posts 13-13' are joined across their upper ends by a connecting bar 13A, and at their lower ends are fixed upon a vertically swinging frame comprising opposite side rails 15 and 15'. These 60 rails are disposed substantially horizontally and transversely aligned relative to the guideway, and somewhat above the level of rails 1 and 2. Also, corresponding ends are equipped with supporting plates 16 which are pivotally secured by 65 pivots 17, respectively, to the rails 1 and 2, as shown best in Figs. 1 and 2; the pivot points being in transverse alignment with respect to the guideway and support those ends of the rails 15-15' which are at the side of the hopper from 70 which the slide table enters. This frame is supported at the swinging ends of these rails by means of set screws 18 which are threaded through the rail ends and extended into supporting contact with brackets 19 fixed to the rails 75 1 and 2. At the lower end of the hopper, oppo-

site ends of the stack of slats rest upon short shelves 20. These are located in the extreme corners of the hopper, as shown best in Figs. 5 and 7. These shelves each comprises a short flat plate that is secured flatly to the under side of 5 its rails 15 and 15' by bolts 24.

It will be observed also, by reference to Fig. 5 that the forward walls of the angle corner posts 13-13' are cut away, as at 23, to permit the 10 lowermost slat of the stack to be pushed out, but to retain all upper slats. Also, it is to be understood that, by supporting the lower slat only at its corners, any warped condition of this lower 15 slat will be less apt to affect the position of the upper slats, and will overcome, to a maximum extent, any difficulty of extraction by jamming.

As the slide table 5 is advanced through beneath the hopper, yieldable fingers 21-21' fixed 20 to the angle corner posts by bolts 22-22' operate to firmly hold the slats 12 down against any tendency, due to a warped condition in the slats, to free themselves from the studs 25-25', etc.

The spacing of the lower end of the stack above the trackway may be accurately regulated by an 25 adjustment of the two supporting screws 18.

Fixed in the slide table top to extend above its top surface, as observed in Fig. 1, are paired studs, as designated at 25-25', 26-26', 27-27', 30 etc., and the studs of each pair are in alignment transversely of the table and the pairs are spaced definitely apart a distance slightly greater than the width of the slats so as to provide for a desired spacing of the slats.

Mounted on the pivoted rails 15-15', at the 35 inside thereof and near hopper 11, are rollers 30. These are so arranged that while the slide table is being advanced from the position of Fig. 2 to that of Fig. 3, they will roll upon the opposite side edge portions of the table 5 and will lift the 40 hopper to the proper elevation for extraction of the slats. By provision of the pivoted support for the hopper and the contact with the table by rollers 30, the problem of using tables of different thicknesses is overcome, and the hopper automatically adjusts itself to the proper position 45 merely by pushing the table beneath it; it being understood, of course, that the set screws 18 are adjusted to permit the hopper to assume a position that will take care of tables of the minimum thickness that are ordinarily used. It will also 50 be observed that a pair of table supporting rollers 31-31' are mounted on the rails 1 and 2 to retain the table from too much frictional contact with the rails while passing beneath the hopper.

Assuming the device to be so constructed, and 55 assuming also that the table is in the position shown in Fig. 2: The operator stands at the right-hand end of the machine, grasps the table by the bar end 6 and pushes it forwardly and beneath the hopper though to a position at the left-hand 60 end of the frame. In passing beneath the hopper, the table engages rollers 30 and lifts the hopper to the proper elevation, and in succession, the pairs of studs engage the lower slats in the hopper, and, as each slat is extracted, the stack drops 65 down in position so that the next pair of studs may engage a slat. Thus, as the table is advanced beneath the hopper, the slats are extracted therefrom and are aligned on the table in the manner illustrated in Fig. 3. After the table 70 has been pushed through to the left-hand end of the machine, the operator then places the end cleats 35-35 in position across the slat ends, as illustrated in Fig. 4. To aid in the alignment of these cleats so as to form a panel, or wall, of 75

a definite width, ends of the cleats are placed against notched-in shoulders 36, formed in the end bar 6, and are also placed with inner edges against the studs at the extreme end of the table 5 x , for example, the studs 25—25' at one end and the studs $x-x$ at the other end. It will be noted that the studs 25—25' and also the studs $x-x$ are set out slightly from the studs therebetween in slide table 5, to act not only as means for extracting the slats 12 from the hopper 11, but also to serve as positioning means for cleats 35 in accurate parallel alignment. Thus, by engaging the shoulders, these rails are brought accurately into end alignment and the opposite end studs 15 insure their accurate, parallel position.

It will be explained here that prior to the placement of the end cleats upon the slats, glue is applied to the cleats on the under surfaces. Then, after they have been placed in position as shown in Fig. 4, the operator inverts the table while holding the slats and cleats tightly in place, and places the assembled slats and cleats in a position to receive pressure, and then removes the table. Successive assemblies are advantageously stacked for pressure and finally the pressure is applied so that all are pressed tightly together during a period of drying. If it should not be desired to secure the parts by gluing, any other suitable means of connection may be employed, such as by stapling or nailing or stitching.

While it is herein contemplated that the table shall be manually moved, it is apparent that this could be done mechanically. It is also understood that mechanical means might be employed for assembling the cleats on the slats to operate coincident with travel of the table, but this is not a material part of this invention.

Having thus described my invention, what I claim as new therein and desire to secure by Letters Patent is—

1. In combination, a horizontal guideway, a hopper supporting frame overlying the guideway and pivotally attached at one end to the guideway to permit the opposite end to be lifted from the plane of the guideway, a hopper mounted on the movable end of the frame with its lower end transversely overlying the guideway; said hopper being designed for the support of a stack of slats therein and having a lateral outlet at its lower end, an assembly table mounted for travel along the guideway and adapted to pass beneath the hopper, extractor studs arranged on the table whereby slats will be successively extracted from the hopper outlet and deposited on the table in alinement against said studs; said hopper frame having lifting members against which the table top engages as the table is advanced beneath the hopper, thereby to lift the hopper to a definite spacing relative to the table top.

2. A device as in claim 1 wherein adjustable means is provided for supporting the swinging

end of the hopper supporting frame at a definite spacing above the guideway.

3. A device as in claim 1 wherein said lifting members comprise rollers that are mounted on the hopper supporting frame in position for rolling contact with the table top surface, and where- 5 in there are rollers on the guideway for the support of the table as it travels beneath the hopper.

4. In combination, a horizontal guideway comprising spaced apart, parallel rails, a hopper 10 frame horizontally overlying the guideway and having pivotal connection at one end therewith whereby the opposite end is permitted to swing upwardly from the guideway, a hopper mounted upon the swinging end of the frame for the sup- 15 port of a stack of slats therein with the slats transversely of the guideway; said hopper having a lateral outlet at its lower end from which slats may be extracted one at a time, a horizontal table movable along the guideway and adapted to pass 20 beneath the hopper frame and hopper, rollers on the hopper frame to be engaged by the table top to lift the hopper into definite spacing relative to the table top as it passes beneath the hopper, rollers on the frame for the support of the table 25 in passing beneath the hopper, extractor studs on the table top arranged to engage and extract the slats successively from the hopper through the said lateral opening and to deposit them on the table top in definite spacing as provided for 30 by the spacing of the extractor studs, and yieldable fingers fixed to the hopper frame to press downwardly on the slats as they are extracted through the lateral opening, thereby to position them against the extractor studs.

5. In combination, a guideway, a vertically movable hopper for containing a stack of slats supported above the guideway, an assembly table mounted on the guideway for travel therealong and adapted to be passed beneath the hopper 40 and to lift the latter to a definite spacing relative to the table top, extractor means arranged in spaced relation lengthwise of the table and projecting upwardly from the top surface thereof and adapted to successively engage and extract 45 slats from the lower end of the stack and to deposit the extracted slats on the table in spaced relation according to the spacing of the extractor means, fingers fixed to the hopper to bear yieldingly downward on the slats as they are ex- 50 tracted, and a cleat alining bar fixed across one end of the table top and against which bar cleats may be engaged to bring their ends into alinement and in definite spacing relative to the edge of the positioned slats; said bar having notched 55 out shoulders at its opposite ends adapted to receive the ends of the cleats therein when placed across the slat ends, thereby to accurately space the cleats and bring them into alinement.

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