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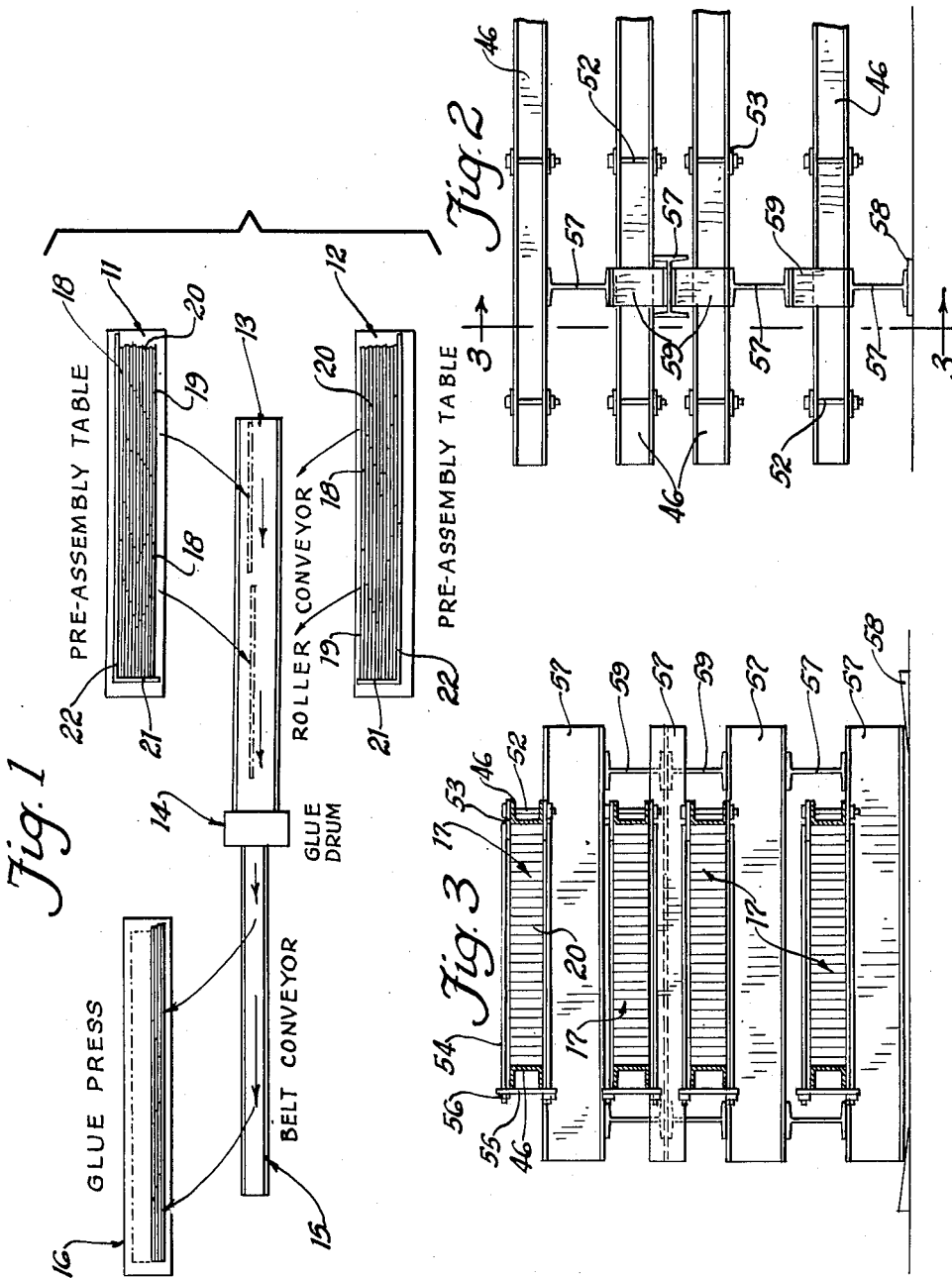
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2,618,302

GLUING PRESS FOR MAKING PLAYBOARDS

Filed Nov. 6, 1948

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

Fig. 4

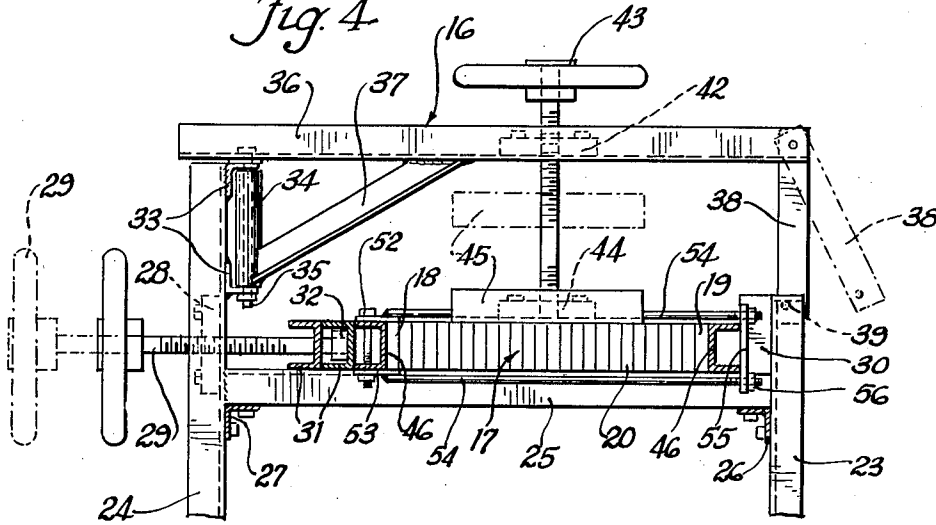
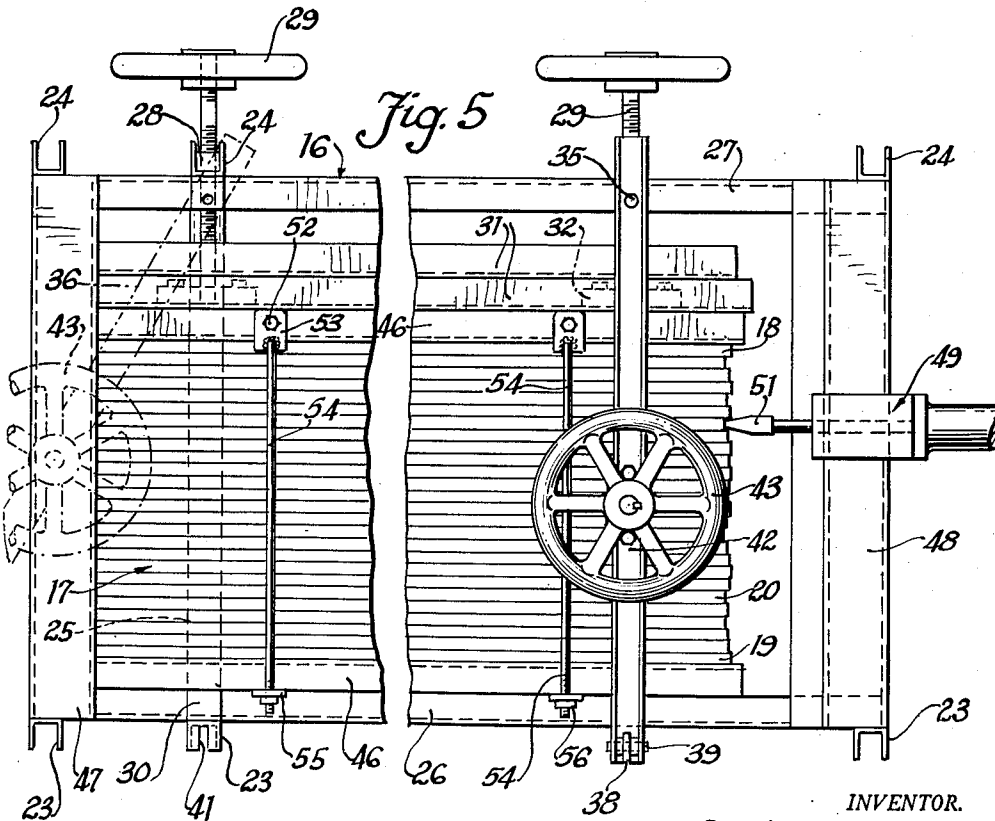


Fig. 5



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UNITED STATES PATENT OFFICE

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GLUING PRESS FOR MAKING PLAYBOARDS

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4 Claims. (Cl. 144—281)

1

This invention relates in general to laminated playboards, and more particularly to a novel method and apparatus for making the same.

A new variation of the well-known game of "shuffleboard" has been devised in which the usual stick for propelling the play pieces has been dispensed with, and the latter are propelled along the playing surface by hand. The playing surface is disposed at approximately normal table height, and in order that skill shall be the paramount requirement in playing this game, the playing surface must be perfectly smooth and level throughout the length of the playboard. A form of table structure for supporting the playboard of such a game is disclosed in my co-pending application for U. S. Letters Patent, Serial No. 57,289, filed October 29, 1948 (now abandoned).

A principal object of the instant invention is the provision of a playboard of the desired length for such a shuffleboard game which meets the above-noted requirements and has a playing surface that will remain in perfect playing condition despite variations in temperature and moisture content of the ambient air, and of a novel method and apparatus for making such a playboard.

More specifically, the playboard contemplated is made up of a plurality of boards, preferably of maple, laminated in edgewise arrangement with adjacent side surfaces secured together by a suitable adhesive to form a unitary structure. This construction has many obvious advantages over one in which adjacent boards are toe-nailed to each other, as is customary in constructing a bowling alley, but presents many problems not encountered in the latter, particularly those resulting from the desire to make the playboards on a mass production basis and those involved in maintaining the several boards in each unit in proper relationship relative to each other until the adhesive employed has set.

Another important object of the invention, therefore, is the provision of a method and apparatus which overcomes such problems and enables the making of these laminated playboards on a mass production basis.

A further object is to provide a gluing press for assembling a plurality of adhesive-coated boards in laminated relationship under pressure, which includes means for maintaining the boards so assembled as a unit under such pressure to enable ready removal thereof from the press to facilitate storage for the necessary critical period, as determined by the setting characteristics of

2

the adhesive employed, and thereby not interfere with continuous use of the press.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, when taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

In the drawings:

Figure 1 is a schematic view in plan of a preferred arrangement of apparatus for practicing the instant method;

Figure 2 is a side elevational view of part of a stack of assembled playboards arranged for storage during the critical setting period;

Figure 3 is a transverse sectional view taken substantially on the line 3—3 of Fig. 2;

Figure 4 is a sectional view taken transversely through the glue press of Fig. 1; and

Figure 5 is a plan view of the glue press of Fig. 4, with the central portion thereof broken away.

Referring more particularly to Fig. 1 of the drawings, reference numerals 11 and 12 designate generally a pair of oppositely disposed pre-assembly tables, between which is placed a conveyor 13 leading toward a glue spreader 14. At the other side of the glue spreader 14, a second conveyor 15 is disposed in adjacent relationship to a glue press 16 in which a plurality of boards, which have had their contacting sides coated with a suitable adhesive by the spreader 14, are assembled under pressure to make up the desired playboard unit.

The playboard is designated generally by reference numeral 17, which is the same reference character as is applied to the playboard illustrated in my above-identified co-pending application, which describes its intended use and a preferred table structure for supporting it. As best seen in Fig. 1, the playboard 17 preferably comprises two outside long boards 18, two outside short boards 19 and a plurality of inside boards 20, all arranged in side-by-side relationship. In the preferred form of this playboard 17, all of such boards 18, 19 and 20 are $\frac{3}{4}$ " thick and $3\frac{1}{2}$ " wide, trimmed over all from selected maple, and the center or inside boards 20 are arranged so that their abutting ends in each row are disposed less than 3" from any similar abutting ends of the boards in the instant adjacent row or rows. In order to meet the above-described playing and use requirements, including that of the finished playboard being satisfactorily resistant to changes in temperature and moisture content of the ambient air, these boards so arranged are

secured together with a suitable adhesive, preferably a urea formaldehyde resin, to form a unitary structure, rather than nailing the adjacent or contacting boards to each other. In order to insure a uniform and satisfactory product, it is necessary that the adhesive-coated boards as assembled in the glue press 16 be so assembled under considerable pressure in all directions of the unit, and that such pressure be maintained for a critical period of time, which is determined by the setting characteristics of the adhesive employed. In the preferred construction employing the particular adhesive above referred to, such setting period must be not less than 14 hours, and in actual practice, in order to provide a suitable factor of safety, the critical period is set at 24 hours.

From the above, it will better be appreciated why the instant invention, which contemplates the manufacture of such playboards on a mass production basis, includes as a preliminary step the pre-selection and trimming of suitable boards (not illustrated herein) to eliminate knots and other defects therefrom, and the pre-assembly of a plurality of boards 18, 19 and 20 in the exact relationship relative to each other in which they are to be assembled to form each playboard unit. The tables 11 and 12 are provided for accomplishing this latter step, and are arranged as illustrated in Fig. 1 to best facilitate the desired mass production. Each of these tables comprises suitable restraining means, including an end rail 21 and a rear rail 22 adjustably secured to the upper surface thereof, and any other suitable guide means, such as outlining lines inscribed thereon, for assisting the operator or operators in their selection of proper boards to make up a complete unit. Two such pre-assembly tables 11 and 12 are provided to enable a continuous flow of material in proper sequential arrangement to the glue press 16, so that pre-assembly of one playboard unit may be effected on one table while the unit previously pre-assembled on the other table is being transmitted to the glue press. Since the preferred playboard is to be 20 inches wide and 20 feet, 8 inches long, each pre-assembled unit will comprise twenty-six boards in width, including the two pairs of outside boards 18 and 19, with each row thereof approximately and not less than 20 feet, 8 inches in length. It will be readily appreciated that the instant invention contemplates the guide means provided on the pre-assembly tables 11 and 12, including the rails 21 and 22, being adjustably mounted thereon to accommodate different numbers and lengths of boards where it is desired to produce playboards having different dimensions from those specifically enumerated herein.

The conveyor 13 placed intermediate the pre-assembly tables 11 and 12 preferably comprises any suitable type of roller conveyor, and is employed to facilitate sequential distribution of the boards 18, 19 and 20 of each pre-assembled playboard unit from the tables to the glue spreader 14. The latter may be any conventional type of machine selectively adjustable to apply the adhesive to either one or both sides of the boards. This latter feature of operation is required, because it is desired to coat only the inner sides of the outside boards 18 and 19 and to coat both sides of the inside boards 20. The conveyor 15, which preferably comprises any suitable motor-driven belt conveyor, extends from the delivery side of the glue spreader 14 for carrying the ad-

hesive-coated boards from the latter into closely adjacent position relative to the glue press 16. As will be appreciated from Fig. 1, the boards 18, 19 and 20 are taken in sequence from their pre-assembled position on one or the other of the tables 11 and 12 and placed upon the conveyor 13, from which they pass through the glue spreader 14 to the conveyor 15. Other operators then remove these adhesive-coated boards and place them on the work bed of the glue press 16 in the same order and relative relation as obtained therebetween on the pre-assembly table.

Referring now to Figs. 4 and 5 of the drawings, it will be seen that the glue press 16 comprises a plurality of vertically disposed frame members 23 spaced along the inner side thereof, which is that side disposed adjacent the conveyor 15, and a plurality of similar, but longer, vertical frame members 24 disposed opposite the members 23 along the outer side of the machine and suitably connected to the associated frame members 23 by longitudinally spaced, horizontally disposed, transverse frame members 25. These members 23, 24 and 25 thus make up, together with suitable cross-bracing members and longitudinally extending, inner and outer side rails 26 and 27 rigidly secured thereto by welding, bolts or the like, a stationary frame in which the vertical members 23 and 24 also function as supporting legs and the transverse members 25 define a horizontally disposed, work-receiving bed. Each of the outer vertical frame members 24 is provided with a tapped block 28, bolted or otherwise rigidly secured in any suitable manner thereto, for receiving the threaded shaft of a pressure screw 29 extending horizontally a short distance above the associated transverse frame member 25, and opposite the inner ends of each of these screws 29, each associated vertical frame member 23 has a stationary pressure plate or block 30 secured in any suitable manner to its inner face above the transverse frame member 25. The inner end of each pressure screw 29 passes through a suitable aperture in the outer one of a pair of longitudinally extending, movable pressure rails 31 secured to each other in any desired manner and slidably resting upon the transverse frame members 25. The inner end of each screw 29 has a pressure block 32 rotatably mounted thereon which is disposed between the horizontal legs of the inner pressure rail 31, so that rotation of all of the screws 29 in one direction will move the pressure rails 31 inwardly on the transverse frame members 25, and rotation of the screws in the opposite direction will retract these movable pressure rails outwardly toward the vertical frame members 24.

A pair of vertically spaced brackets 33 are provided on the inner side of each of the outer vertical frame members 24 adjacent the upper ends thereof, and between each of these associate pairs of brackets is disposed a sleeve 34 rotatably mounted upon a vertical pivot bolt 35 extending through the brackets. On the upper end of each bolt 35 is pivotally mounted a horizontally disposed rail 36, with a suitable washer being interposed between the under surface of each of these channels or rails 36 and the associated upper bracket 33. Each rail 36 is supported intermediate its ends by the upper end of an angularly disposed brace 37, in turn secured at its lower end to the associated sleeve 34. Each rail or channel 36 has the upper end of a link 38 pivotally connected to its inner end, and each link 38 is provided adjacent its lower end with a longitudi-

5

nally extending pin 39 adapted to cooperate with the upper end of the associated inner vertical frame member 23, the latter being slotted, as shown at 41 in Fig. 5, to receive the lower end of the link 38. The several rails or channels 36 and their attached parts together comprise an auxiliary frame, and each is adapted to be swung on its pivot bolt 35 between a transverse, operative position, as illustrated in full lines in Figs. 4 and 5, and a longitudinally extending, inoperative position substantially normal thereto and parallel with the outer side rail 27. An intermediate position of one of these auxiliary frame members is shown in broken lines at the left side of Fig. 5. Intermediate its ends, each of these rails or channels 36 is provided with a tapped block 42 similar to the block 28 for receiving the threaded shaft or shank of a vertically disposed pressure screw 43, and the bottom end of each screw 43 has a similar block 44 rotatably mounted thereon, which is secured in any suitable manner to a horizontally disposed pressure rail 45. Whenever it is desired to move these auxiliary frames to their inoperative positions, it is necessary only to raise the associated pressure rail 45 by rotating the screw 43, move the link 38 to its broken line position of Fig. 4 to disengage the pin 39 from the upper end of its associated vertical frame member 23, and swing the unit rearwardly on its pivot bolt 35.

As previously explained, the adhesive-coated boards 18, 19 and 20 are placed from the conveyor 15 on the work bed of the glue press 16 (in edge-wise relationship on the transverse frame members 25) in the same arrangement as obtained in their pre-assembled position on the table 11 or 12. It will be understood that, prior to such assembly of the coated boards on the work bed of the glue press, the auxiliary frames, comprising the several rails 36, and their associated vertical pressure means, comprising the screws 43, have been swung rearwardly to their inoperative positions, and the movable pressure rails 31 have been retracted by the lateral pressure means, comprising the screws 29, having been moved to their broken line inoperative positions of Fig. 4. Also prior to such assembly of the several boards intended to make up a playboard unit 17, a pair of loose side rails 46, comprising ship channels of heavy construction, are mounted on the transverse frame members 25 with their parallel legs extending outwardly, one of these side rails 46 being disposed in edge contacting relationship with the stationary pressure means or blocks 30, and the other similarly contacting the inner one of the movable pressure rails 31 in its retracted position. After all of the boards 18, 19 and 20 for a particular playboard unit 17 have been so assembled on the work bed of the press 16, lateral pressure is applied thereto by tightening of the several screws 29 to move the rails 31 and the associated side rail 46 inwardly against such assembled boards and against the other side rail 46 and stationary pressure blocks 30. During the application of such lateral pressure, vertical pressure also is applied to the upper edges of the boards to insure proper vertical alignment thereof. This vertical pressure is applied by means of the several screws 43, the auxiliary frames, including the rails 36, having first been swung to their full line, operative positions of Figs. 4 and 5 and their links 38 dropped to engage the pins 39 with the upper ends of the associated vertical frame members 23. It has been found that it is not necessary that the hori-

6

zontal pressure rail 45 be of sufficient length to engage the upper edges of all of the boards, but it may be necessary from time to time, during the application of such vertical and lateral pressure by these pressure means, to apply additional pressure to specific high points developing in the playboard unit with rubber mallets, or the like.

At the same time, pressure also is applied longitudinally to the several rows of boards to insure proper end-to-end abutting relationship of the different boards in each row. For this purpose, a stationary end backing plate 47 is mounted on the far end of the press (Fig. 5) which is rigidly secured thereto, such as to the side rails 26 and 27 and the end vertical frame members 23 and 24. At the opposite end of the press is rigidly mounted a transverse slide 48 on which is slidably disposed an hydraulic or pneumatic ram or other suitable pressure-applying device 49 having a head 51 of such dimensions as to enable selective application of pressure individually to the exposed ends of the several boards 18, 19 and 20. It will be understood that the specific details of this end pressure-applying mechanism 49 are not of particular importance, so long as this mechanism may be selectively moved on the slide 48 transversely of the machine to enable application of pressure by the head 51 to any desired row of boards in the assembled playboard unit 17 mounted on the work bed.

Having so assembled all of the boards 18, 19 and 20 in their final position, it is necessary to maintain the same in such condition under pressure for a sufficient period of time to permit the adhesive to set. As previously noted herein, this critical period in the case of the preferred form of playboard herein illustrated is 14 hours, while it has been found that a 24 hour period is preferable in order to provide a sufficient factor of safety to insure permanent setting of the adhesive and retention of the individual boards in their final assembled position. It is, of course, impractical to maintain the assembled playboard unit 17 in the press 16 for this critical setting period, and it is for this reason that the loose side rails 46 are interposed in the manner previously described between the playboard unit and the stationary pressure plates 30, and movable pressure rails 31, respectively. The press 16 has been constructed in the described manner to enable holding means to be applied to these side rails 46 and the assembled playboard 17 to maintain the individual boards comprising the latter under the pressures applied thereto by the press. Also, because of the length of the playboard 17, it is necessary to employ very rigid side rails, and this is the reason that heavy ship channels are used for these side rails 46. The rails 46 are identical in construction to enable them to be employed interchangeably at either side of the work bed, and include a plurality of suitable apertures through their horizontally disposed leg portions spaced at convenient points longitudinally thereof. The pressure-maintaining means referred to comprises a plurality of bolts 52 for engagement, respectively, in these apertures in the outer side rail 46 (Fig. 4). Each bolt 52 also passes through suitable apertures in a plate 53, and each plate 53 has one end of a rod 54 welded or otherwise suitably secured thereto, there being two of such rods 54 and plates 53 for each bolt 52. After the playboard 17 has been so finally assembled, one of these rods 54 is placed across the unit adjacent each transverse vertical frame member 25, a bolt 52

is dropped through the aperture in the plate 53 and the apertures in the inner side rail 46, another rod 54 is similarly arranged across the underside of the playboard with the aperture in its plate 53 engaging the bolt, and a suitable nut is screwed onto the end of the bolt to secure the outer ends of the rod and plate assemblies to the outer side rail 46. A saddle clamp or plate 55 is then mounted on the inner ends of these two rods 54 (Fig. 4) exteriorly of the inner rail 46, and suitable nuts 56 are screwed onto the inner threaded ends of the rods to effect a clamping together of the side rails 46. It will be understood that a plurality of such clamping means are employed at suitably spaced intervals longitudinally of the side rails 46, and the pressure applied to the playboard unit by the press 16 is thus maintained thereon.

After all of these pressure-retaining means have been so applied to the side rails 46, the pressure rails 31 are retracted by returning the several screws 23 to their broken line position of Fig. 4, and the auxiliary frames are returned to their inoperative positions by raising the vertical pressure screws 43, releasing the links 33 and swinging the rails 36 rearwardly on their pivot bolts 35. The assembled playboard unit 17, as thus retained by the side rails 46 and pressure-maintaining means 52-56, then is removed from the press 16 by traveling crane, block and tackle, or the like, and placed in a suitable storage position, where it is maintained for the required adhesive-setting period.

During this critical setting period, it is essential that the playboard units 17 be maintained level throughout their length. In order to accomplish this and to conserve storage space, because of the considerable length of the playboard, a novel means and method for so storing the assembled playboard units has been devised which is illustrated in Figs. 2 and 3. A plurality of transverse I-beams 57 are placed on the floor of the storage space in parallel relationship to each other and spaced apart in the same relationship as the several transverse frame members 25 of the press 16. Each end of each of these I-beams 57 is placed upon a suitable leveling wedge 58, and after an assembled playboard 17 has been laid across this bottom row of I-beams 57, as shown in Figs. 2 and 3, the operators effect an absolute levelling of the unit longitudinally and transversely thereof by driving the individual wedges 58 the necessary distances inwardly or outwardly of the I-beams 57 to accomplish this result. Thereafter, as successive assembled playboard units 17 are brought from the press 16, they are mounted upon these lowermost levelled I-beams 57 in vertically stacked relationship, as illustrated in Figs. 2 and 3. The next playboard 17 is so arranged by placing a pair of short I-beams 59 on each of the I-beams 57 and supporting a similar I-beam 57 thereon for supporting the second playboard 17. For supporting the third-from-the-bottom playboard 17 in this stacked relation, additional short I-beams 59 are similarly placed on each of the second I-beams 57, and a third row of I-beams 57 is placed horizontally thereon, with their web portions resting upon the upper ends of these short I-beams 59. The third playboard 17 is then mounted on the upper edges of the parallel leg portions of this third row of I-beams 57. The next uppermost playboard 17 is mounted in this stack by placing additional short I-beams 59 directly over those in the lower section of the

stack on the web of the third row of I-beams 57, and mounting a fourth row of I-beams 57 thereon, with their webs vertically disposed, for supporting the fourth playboard 17. Such stack of playboards may be continued upwardly, depending upon the loading capacity of the storage floor, it being borne in mind that each of the preferred embodiments of the playboard herein described, without its pressure-retaining means, weighs in excess of 500 lbs. Since all of the I-beams 57 employed are identical with each other, and each short I-beam 59 is identical with each other I-beam 59, it will be appreciated that all of the playboards 17 so mounted in stacked relation will be maintained absolutely level throughout their length, the lowermost of these units having first been so levelled by individually adjusting the wedges 58 in the manner previously described. It is not necessary that the different rows of I-beams 57 be differently arranged in the manner described, with some of them having their web portions disposed horizontally, but this arrangement has been found to give maximum stability to the stack. After each assembled playboard unit 17 has been so stored for the critical period necessary to assure permanent setting of the adhesive employed between adjacent boards, the pressure-maintaining means 46 and 52-56 are removed therefrom, and the playboard is removed from such storage stack.

This assembled playboard unit is then finished in the following manner. It is first passed through a double-surface planer, and then through a suitable triple-drum sander which mechanically sands the upper surface thereof. The playboard unit is then measured for length, approximately one-half of the excess is removed by trimming one end in a suitable saw, it is re-measured for length and similarly trimmed to proper length at the other end, and suitable play-scoring lines are scored transversely across the upper surface thereof. This upper surface and the edges are then hand-sanded to insure as smooth an upper surface as possible which also is level throughout the length of the board. The playboard is then turned over, and the bottom, side and end surfaces are finished, preferably by spraying two coats of a suitable lacquer thereon. After this lacquer finish has dried, the board is again turned over, and three similar coats of finishing lacquer are applied to the top surface, with suitable drying periods intervening and this upper surface being hand-sanded and having a sealing coat applied between the second and third such lacquer coatings. After final drying, the upper surface of the board is then hand-rubbed and polished.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction, and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment of the invention.

I claim:

1. A gluing press, comprising a stationary frame, including transverse members spaced longitudinally thereof to define a work-receiving bed, and vertically disposed members for supporting the same, stationary pressure means disposed along one side of said frame, a movable pressure rail slidably mounted on said transverse members, means mounted on each of a plurality of

said vertically disposed members for applying lateral pressure to said movable rail, a plurality of auxiliary frames pivotally mounted on said frame for swinging movement between transverse positions in alignment with said transverse members and longitudinal positions substantially normal thereto, and means mounted upon each of said auxiliary frames for applying pressure against the work placed on said bed.

2. A gluing press, comprising a stationary frame, including transverse members spaced longitudinally thereof to define a work-receiving bed, and vertically disposed members for supporting the same, stationary pressure means disposed along one side of said frame, a movable pressure rail slidably mounted on said transverse members, means mounted on each of a plurality of said vertically disposed members for applying lateral pressure to said movable rail towards said stationary pressure means, a plurality of auxiliary frames pivotally mounted on said frame for swinging movement between operative, transverse positions in alignment with said transverse members and inoperative, longitudinal positions substantially normal thereto, and means mounted upon each of said auxiliary frames for applying pressure against the work placed on said bed, each of said auxiliary frames being mounted at one end on a vertical pivot adjacent one end of the associated transverse member, and having releasable means mounted on its other end for engaging the other end of the associated transverse member to maintain the auxiliary frame stationary during operation of the associated pressure means.

3. A gluing press, comprising a stationary frame, including transverse members spaced longitudinally thereof to define a work-receiving bed, and vertically disposed members for supporting the same, stationary side backing plates disposed along one side of said frame, a movable

pressure rail slidably mounted on said transverse members, means mounted on each of a plurality of said vertically disposed members for applying lateral pressure to said movable rail towards said side backing plates, a plurality of auxiliary frames pivotally mounted on said frame for swinging movement between transverse positions in alignment with said transverse members and longitudinal positions substantially normal thereto, means mounted upon each of said auxiliary frames for applying downward pressure against the work placed on said bed, a stationary end backing plate extending transversely along one end of said frame, and pressure means mounted at the other end of said frame for applying end pressure towards said end backing plate against the work placed on said bed.

4. A gluing press according to claim 3, wherein said end pressure means is selectively movable laterally to enable application of pressure at any desired point on a line extending transversely across said bed.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
145,221	Maitre	Dec. 2, 1873
590,047	Ovenshire	Sept. 14, 1897
704,553	Lindstrom	July 15, 1902
764,117	Dolge	July 5, 1904
1,578,898	Littleford	Mar. 30, 1926
1,628,113	Burns	May 10, 1927
1,664,207	Francis	Mar. 27, 1928
1,684,548	Loetscher	Sept. 18, 1928
2,177,395	Thompson et al.	Oct. 24, 1939
2,260,716	Kotler	Oct. 28, 1941