No. 869,923. PATENTED NOV. 5, 1907.

A. MEREEN & C. JOHNSON.

MACHINE FOR UNITING MATCHED BOARDS.

APPLICATION FILED MAY 4, 1906.

4 SHEETS—SHEET 1.

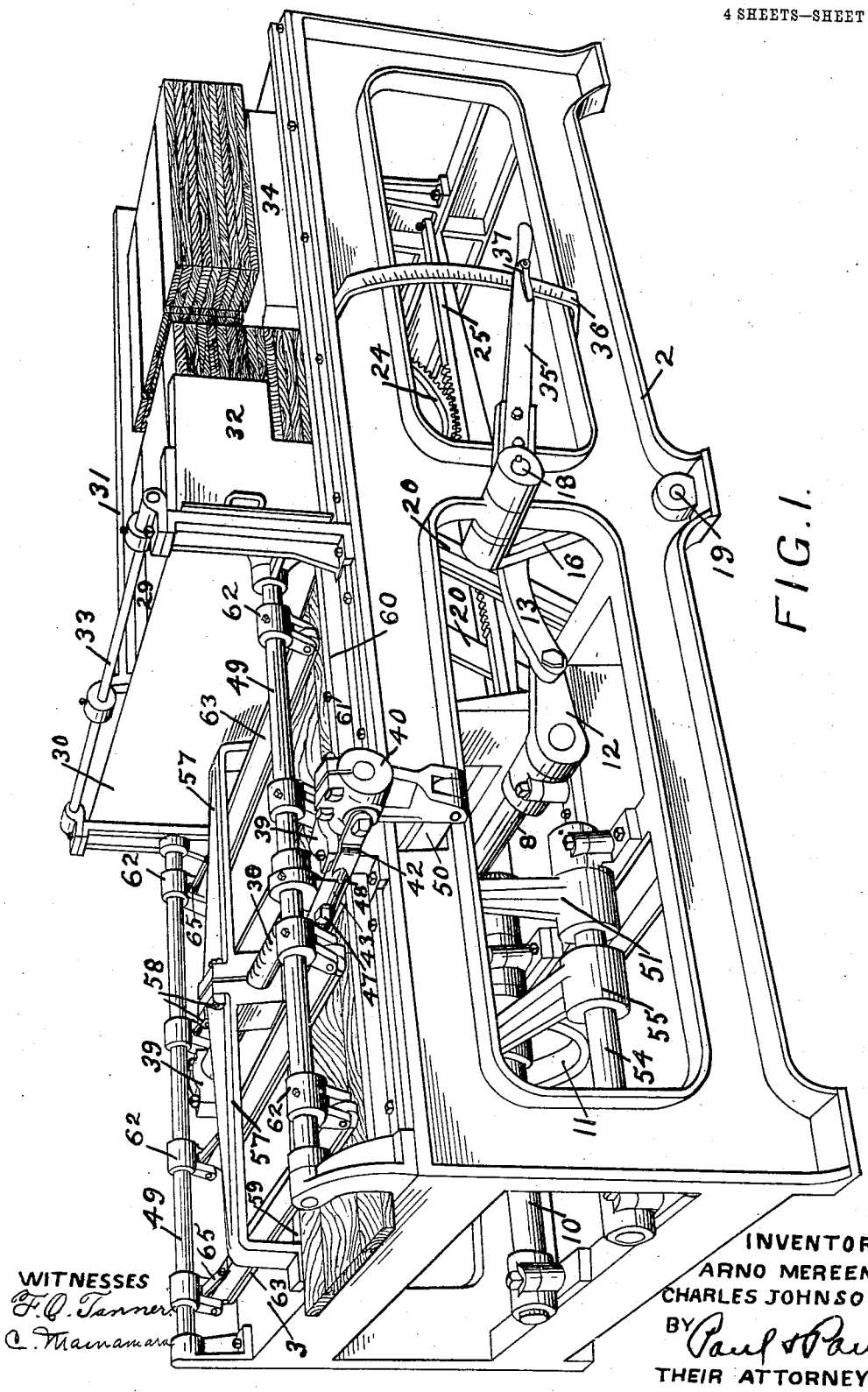


FIG. 1.

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4 SHEETS—SHEET 2.

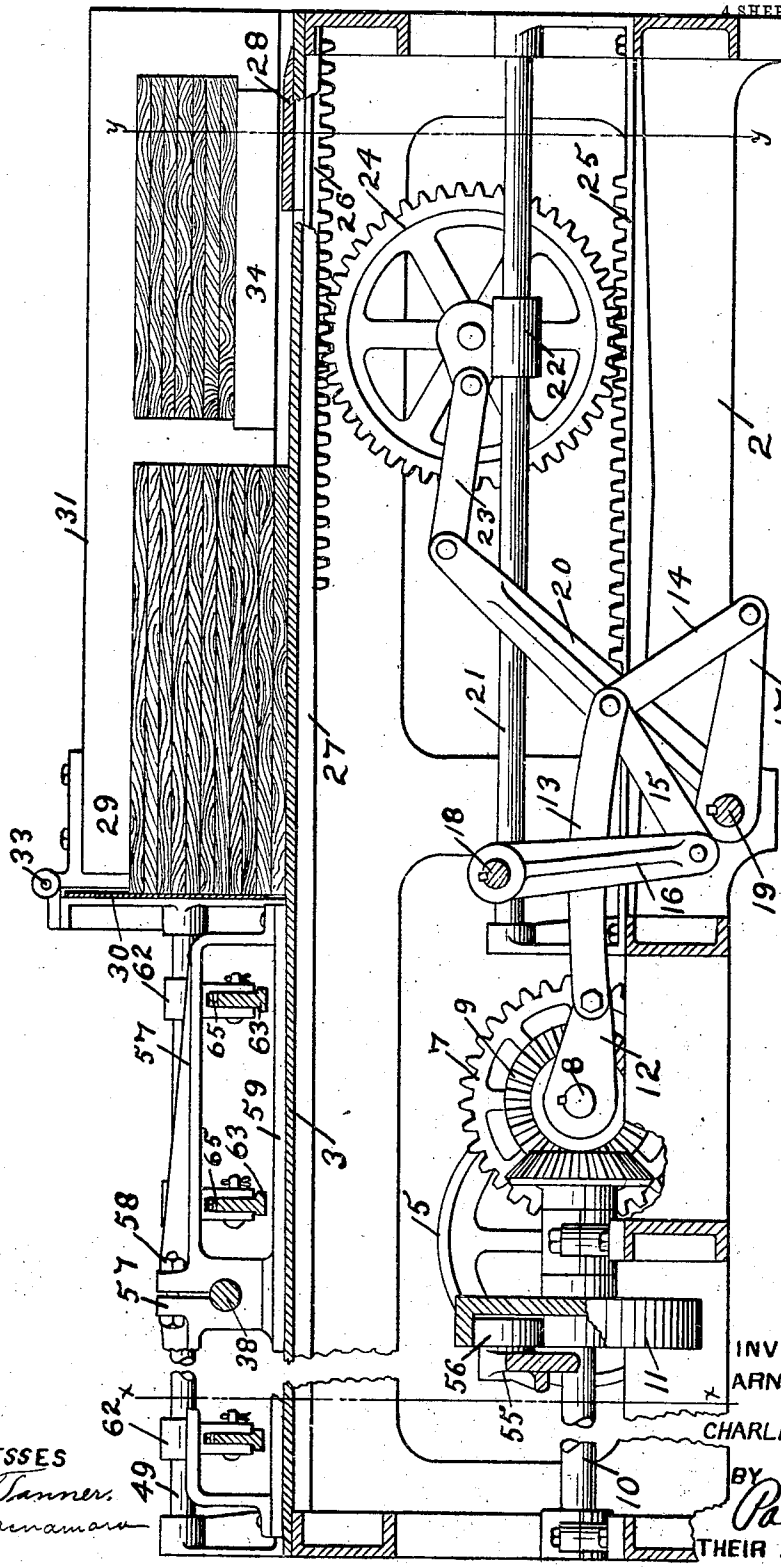


FIG. 2.

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4 SHEETS—SHEET 3.

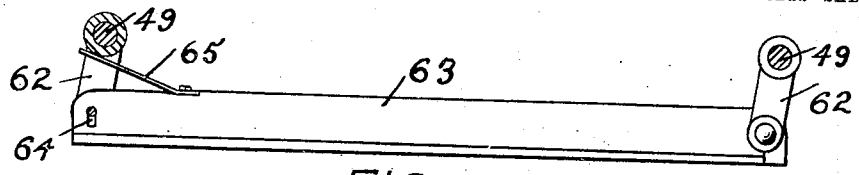


FIG.6.

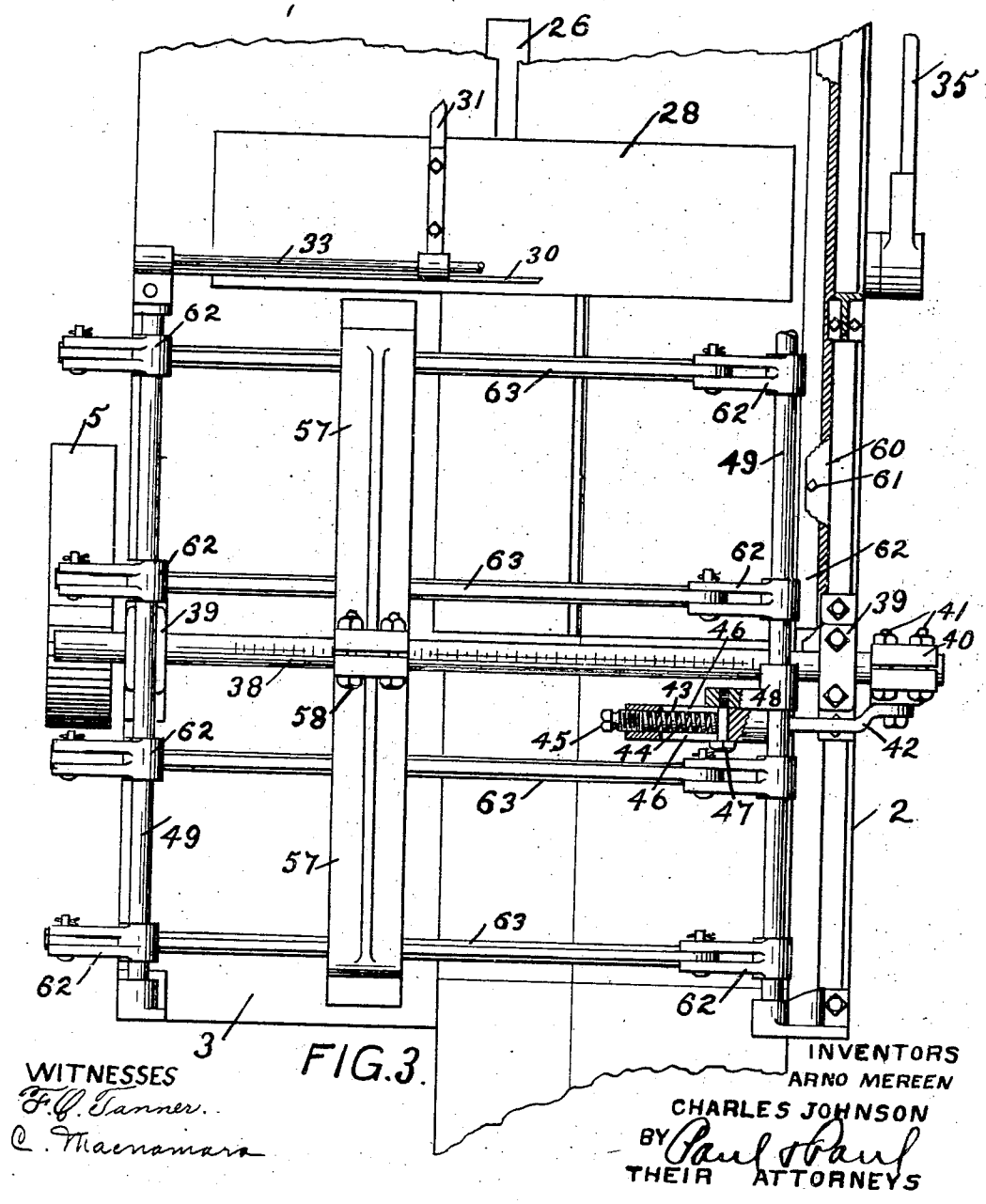


FIG.3.

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4 SHEETS—SHEET 4.

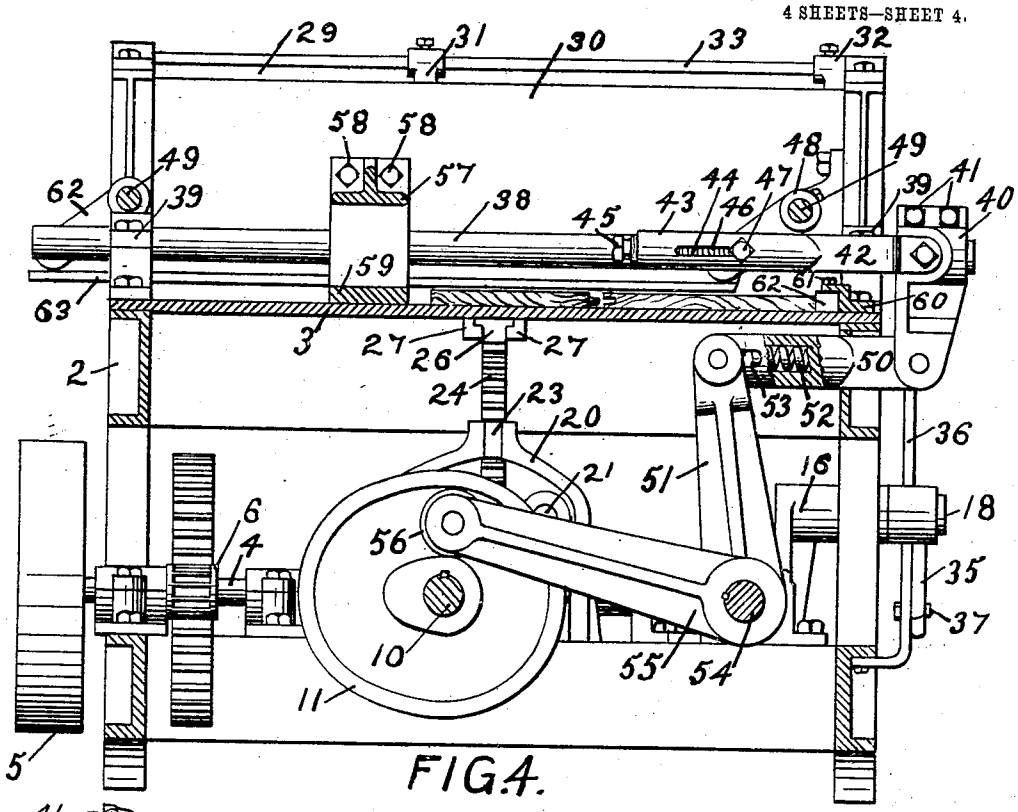


FIG.4.

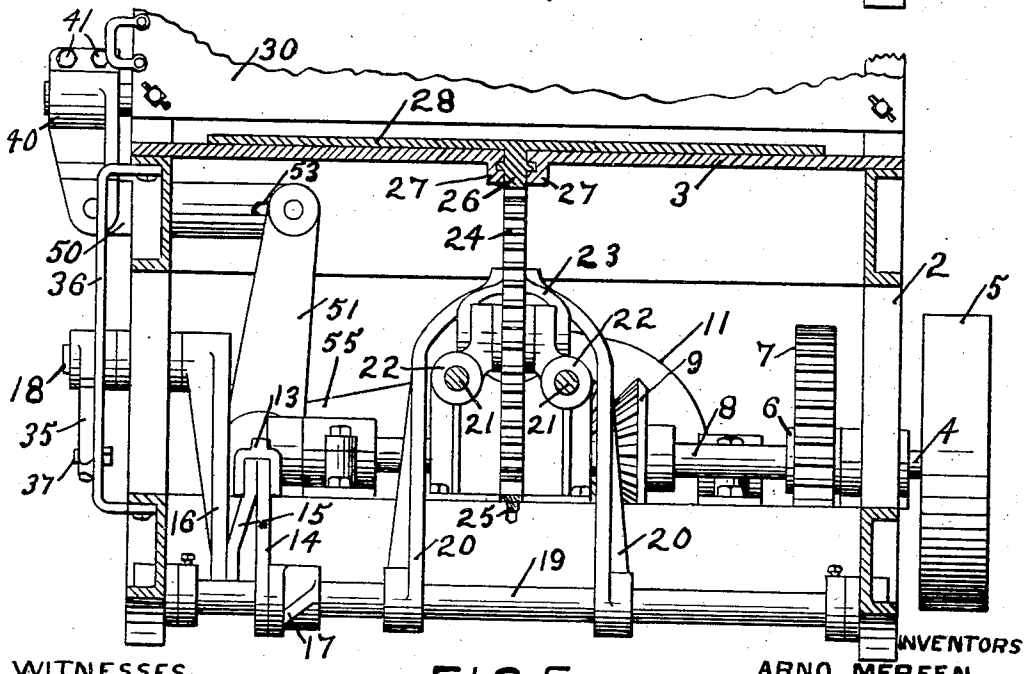


FIG.5.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR UNITING MATCHED BOARDS.

No. 869,923. Specification of Letters Patent. Patented Nov. 5, 1907.

Application filed May 4, 1905. Serial No. 258,793.

To all whom it may concern:

Be it known that we, ARNO MEREEN and CHARLES JOHNSON, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Machines for Uniting Matched Boards, of which the following is a specification.

The object of our invention is to provide a machine wherein the matched boards comprising the bottom, sides or top of a box can be easily and quickly united with their ends in perfect alinement with one another.

A further object is to provide a machine of simple construction and one that is strong and durable and has a large capacity.

The invention consists generally in means for feeding the matched box boards endwise side by side and applying pressure laterally to the boards to unite their contiguous matched edges.

Further, the invention consists in means for regulating the stroke of the feed according to the length of the boards.

Further, the invention consists in providing a laterally operating presser device and yielding means in connection therewith.

Further, the invention consists in providing means operating simultaneously with said presser device to bear on the upper surfaces of the boards and hold them flat upon the table during the process of uniting their matched edges.

Further, the invention consists in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification, Figure 1 is a perspective view of a machine for uniting matched boards embodying our invention. Fig. 2 is a longitudinal vertical section of the same illustrating the feed operating mechanism. Fig. 3 is a plan view of one end of the machine showing the position of the presser or squeezing device thereon. Fig. 4 is a transverse vertical section on the line x—x of Fig. 2. Fig. 5 is a similar view on the line y—y of Fig. 2. Fig. 6 is a detail of one of the horizontal bars that bears upon the upper surfaces of the boards while their edges are being pressed together.

In the drawing, 2 represents a suitable frame supporting a flat topped table 3 whereon the feeding and pressing mechanism of the machine is located.

4 is a drive shaft having a driven pulley 5 and a pinion 6 meshing with a gear 7 on a shaft 8 provided with a bevel gear 9. A similar gear is mounted on a cam shaft 10 carrying a cam 11. The crank 12 is secured on the shaft 8, and is connected through links 13, 14 and 15 with crank arms 16 and 17, the former having a fixed pivot 18 and the latter being secured on a rock shaft 19. A yoke 20 is secured on the shaft 19 and straddles parallel horizontal rods 21 on which blocks 22 are slidable and connected by links 23 with the yoke 20. A gear 24 has bearings in the block 22 and meshes with the teeth of a fixed rack bar 25 and also with a rack bar 26 that is adapted to travel in guides 27 and carries a plate 28 which slides back and forth on one end of the table and engages the ends of the boards to feed them into the path of the presser device at the other end of the table. A hopper 29 is provided on the table wherein the boards are piled one above another, there being a sufficient space formed between the lower edge of the hopper wall 30 and the top of the table, to allow a series of boards lying side by side to be moved endwise along the table. The side walls 31 and 32 are adjustable on a rod 33 to adapt the hopper for boards of different width, or for a greater or less number of them. A platform or support 34 is provided near the hopper whereon the piles of matched boards are placed preparatory to being piled in the hopper in the path of the feed device. The lever 35 is secured on the pivot 18 and travels past a graduated bar 36 and is adapted to be locked thereon by a clamp 37, and said lever permits the operator to change the position of the compound link connection between the rock shaft 19 and the crank arm 12 for the purpose of regulating the travel of the gear 24 and the length of stroke of the feed device. The feed device through its link connection with the driving mechanism moves slowly as it approaches the end of its stroke in one direction and leaves the feed of boards with even ends, or alined with one another, so that when their matched edges are pressed together and united one board will not project beyond the end of another, which frequently would be the case if the feed device moved rapidly at the end of its stroke and stopped quickly and allowed the momentum of the boards to carry them forward and leave them irregularly arranged with respect to one another.

The compound link mechanism is similar to the one described in Letters Patent of the United States issued to Arno Mereen, August 25, 1903, No. 737,434, and need not be described or claimed broadly herein.

The inner end of the hopper is preferably located near the middle of the machine to allow sufficient space at one end of the table to pile the boards and operate the feed device, while the other end of the table is occupied by the mechanism that engages the edges of the boards to press or squeeze them together. This mechanism we will new proceed to describe in detail.

38 is a rod transversely arranged on the table and slidably mounted at each end in bearings 39. The rod projects beyond the table on each side, and at one end is provided with a block 40 adjustably clamped thereon by means of bolts 41, or in any other suitable way. A bar 42 is pivotally connected at one end to the block 40 and has a socket 43 in its opposite end wherein a coil spring 44 is arranged, the compression of said spring being regulated by means of a threaded plug 45 that fits within one end of said socket. Slots 46 are

provided in the walls of said sockets wherein a bolt 47 is slidable and attached to a crank 48 on a rock shaft 49. The movement, therefore, of the block 40 will reciprocate the bar 42 and oscillate the shaft 49 against the tension of the spring 44. The block 40 is operated preferably through a bar 50 that has a yielding sliding connection with an arm 51 through a spring 52 and slot 53 in said bar. The arm 51 is secured on a rock shaft 54 that also carries an arm 55 having an anti-friction roller 56 to travel in the cam 11. The revolution of this cam will therefore impart an oscillating movement to the shaft 54 and reciprocate the block 40 and mechanism connected therewith. The rod 38 is provided with a series of graduations or marks, and arms 57 are adjustably secured thereon by means of bolts 58, and said arms carry a presser plate 59 that slides transversely on the surface of the table and bears against the edge of the board on that side to force it against the other boards and press their contiguous matched edges together. An angle bar 60 is provided on one side of the table having one of its flanges overhanging the same and carrying a set screw 61 that is adapted to engage and clamp a bar 62 against which the boards on one side are pressed during the operation of uniting their edges. This bar is preferably made adjustable lengthwise on the table to allow its position to be changed according to the length of the boards that are being united. A feed of boards will have their edges joined together with every stroke of the pressure plate, and when the next feed is advanced into position to be operated upon the preceding feed will be pushed ahead in front of the bar 62, and then when the plate operates on the second feed it will not contact with the boards of the first feed, and there will be no danger of their joints being opened again. The spring 52 will yield sufficiently to act as a cushion and take up all the lost motion of the operating parts and allow the mechanism to accommodate itself to any slight variation in the width of the boards. A rock shaft similar to the shaft 49 and parallel therewith is provided on the opposite side of the table, and both shafts are provided with arms 62 pivotally connected by bars 63 having lower edges that are adapted to bear upon the upper surface of the boards and hold them flatwise on the table during the operation of uniting their matched edges. The movement of the bars 63 is so timed that they will engage the surfaces of the boards simultaneously with the engagement of the presser bar with the edge of the feed of boards, and a perfect union of the matched edges is thereby insured. The bars 63 at one end have slots 64 to allow a slight vertical movement of said bars on their pivots, and flat springs 65 are mounted on said bars and yieldingly hold their vertically moving ends at the limit of their downward movement, but allow them to rise and accommodate themselves to any variation in the thickness of the boards that are being operated on.

The operation of the machine is as follows: A pile of boards having been placed in the hopper the operator will adjust the lever 35 to regulate the stroke of the feed device, and the machine having been set in motion the bottom layer of boards will be engaged by the feed device and pushed forward endwise out of the hopper into the path of the presser plate that has previously been adjusted to the width of the boards. The speed of the feed device will be gradually reduced as the feed of boards passes on to that portion of the table over which the presser mechanism operates, and when the said feed device begins its return stroke it will leave the boards with their ends in perfect alinement with one another. The reciprocation of the rod 38 will move the plate against the edge of the outer board and force it toward the others, and the outer board on the other side engaging the adjustable bar 62 will cause the contiguous edges of the boards to be pressed together and the tongues and grooves therein united. The presser plate then recedes, and the feed device advancing another layer of boards will shove the first layer out from between the plate and the bar 62 and discharge it at the end of the table.

We claim as our invention:

1. The combination, with means for feeding boards endwise arranged side by side and having matched contiguous edges, of means for applying pressure to one edge of the feed of boards to force their contiguous edges together, and a lengthwise adjustable backing device against which the opposite edge of the feed of boards is pressed when pressure is applied to said first named edge, substantially as described.

2. The combination, with means for feeding boards endwise arranged side by side and having matched contiguous edges, of an adjustable presser device arranged to engage one edge of the feed of boards and force their contiguous edges together, and a lengthwise adjustable stop or backing against which the opposite edge of the feed of boards is pressed, substantially as described.

3. The combination, with a table, of means for feeding boards endwise arranged side by side thereon and having matched contiguous edges, a reciprocating rod supported above said table transversely thereof, a presser device adjustably mounted on said rod and arranged to engage one edge of the feed of boards, a lengthwise adjustable stop for the opposite edge, and means for operating said rod and presser device to force the contiguous edges of the boards together, substantially as described.

4. The combination, with a table, of a presser device operating transversely thereon, a feed mechanism arranged to feed boards placed side by side and having matched contiguous edges endwise into the path of said presser device, said presser device engaging the edge of the outer board on one side, and a stop arranged to engage the edge of the outer board on the other side and resist the action of said presser device, and said stop being adjustable lengthwise of said boards to allow each feed after being engaged once by said presser device to be moved by the succeeding feed out of the path of said presser device, substantially as described.

5. The combination, with a table adapted to receive boards arranged side by side with matched contiguous edges, of means for holding the boards flatwise upon said table, and means for applying pressure to their edges to unite them, said two means being operatively connected with each other so as to be simultaneously operated, substantially as described.

6. The combination, with a table adapted to receive boards placed thereon side by side and having matched contiguous edges, of depressible bars for engaging the upper surfaces of the boards with a yielding pressure to hold them flatwise upon said table, means arranged to engage the outer edges of the feed of boards to press their matched edges together, and means for depressing said bars when the boards are being pressed together, and lifting them when the boards are being moved in the line of their feed.

7. The combination, with a table, of means for feeding boards having matched contiguous edges endwise thereon, a presser device arranged to engage one edge of the feed of boards and squeeze their matched edges together, bars arranged to bear on the upper surfaces of said boards with a yielding pressure simultaneously with the squeezing operation, and a backing arranged to engage the edge of the feed of boards on the opposite side from said presser device,

and said backing being adjustable lengthwise of said boards whereby as each feed of boards is moved forward by the succeeding feed only one engagement of the presser device with each feed will be permitted.

8. The combination, with a table, of a sliding presser device arranged thereon and operating transversely thereof to engage the edges of boards placed side by side on the table and having matched contiguous edges, a bar connected with said presser device, and adapted to press upon the boards an oscillating arm means for operating the same, and a yielding connection between said arm and bar, for the purpose specified.

9. The combination, with a table, of rock shafts mounted thereon and provided with depending arms, bars connecting said arms across the table and having a yielding connection therewith at one end, a sliding presser device operating beneath said bars, an operating means having a yielding connection with said rock shafts and with said presser device, and means for feeding boards with matched edges into the path of travel of said presser device, beneath said arms, substantially as described.

10. The combination, with a table whereon the boards are placed side by side and having contiguous matched edges, of bars supported above said table and arranged to bear upon the upper surface of the boards, rock shafts provided with a series of arms whereon said bars are supported, a bar having a sliding pivotal connection with one of said shafts, a spring provided in said bar and bearing on its pivotal connection with said shaft, means for regulating the tension of said spring, and means for rocking said shaft.

11. The combination, with a table provided with a stop on one side, of a presser plate operating transversely on said table toward and from said stop, a reciprocating feed device arranged to feed boards endwise placed side by side with matched contiguous edges between said presser plate and said stop, means arranged to exert a yielding pressure on the upper surfaces of the boards and means for actuating said yielding pressure means simultaneously with the engagement of the pressure device therewith, substantially as described.

In witness whereof, we have hereunto set our hands this 1st day of May 1905.

ARNO MEREEN.
CHARLES JOHNSON.

Witnesses:
C. G. HANSON,
C. MACNAMARA.