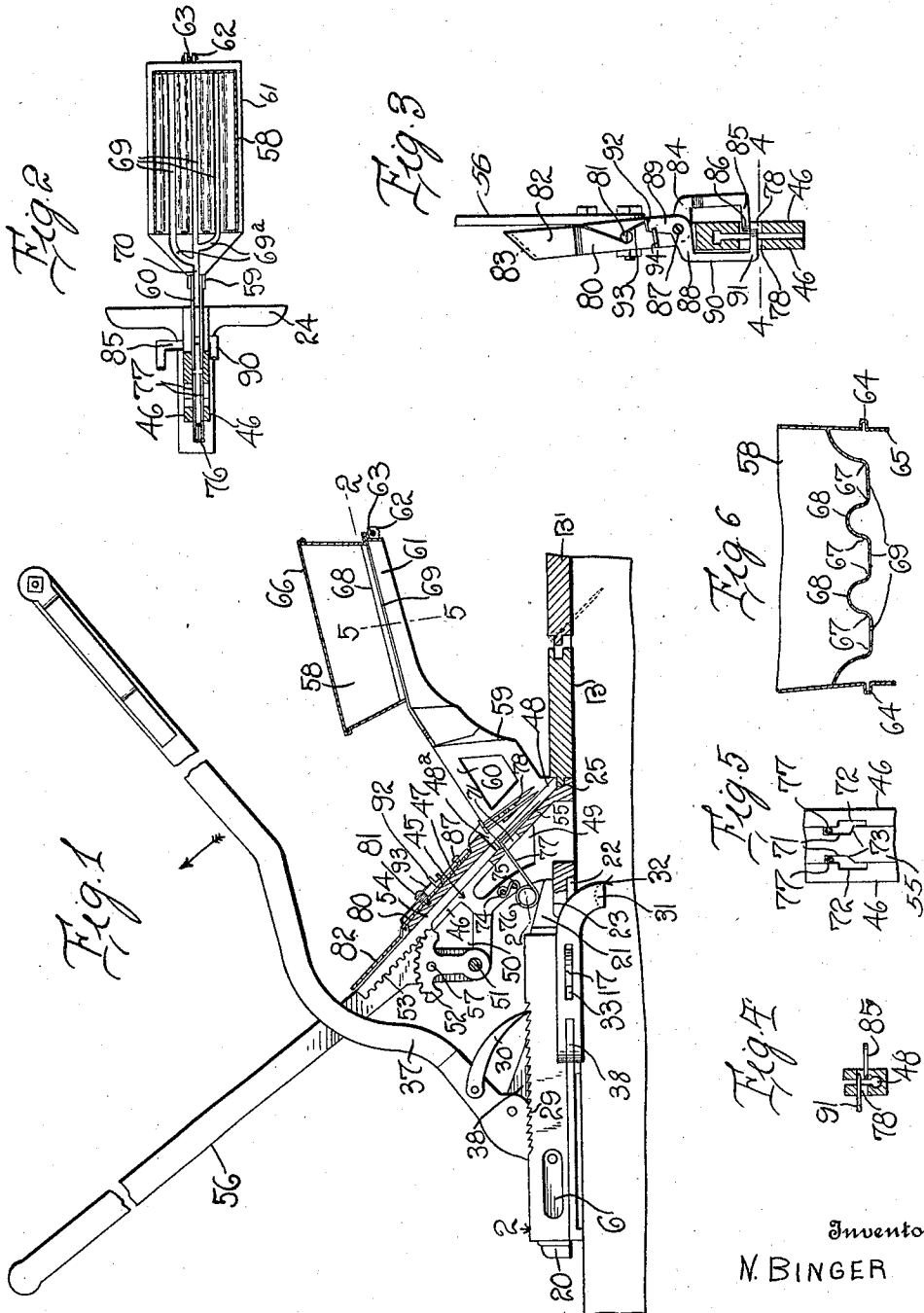


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MACHINE FOR CLAMPING AND NAILING BOARDS.
APPLICATION FILED JULY 24, 1915.

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MACHINE FOR CLAMPING AND NAILING BOARDS.

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Specification of Letters Patent.

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Original application filed April 7, 1915, Serial No. 19,755. Divided and this application filed July 24, 1915. Serial No. 41,756.

To all whom it may concern:

Be it known that I, NICKOLAUS BINGER, citizen of the United States, residing at San Antonio, in the county of Bexar and State of Texas, have invented certain new and useful Improvements in Machines for Clamping and Nailing Boards, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to devices for placing, clamping, and nailing flooring boards, ceiling boards, side and overhead sheathing and for use under like circumstances.

In the art of carpentry it is necessary in laying flooring boards, sheathing or ceiling boards that the boards be forced firmly into position abutted against previously nailed boards. The usual method of doing this is by hammering upon the edges of the boards, thereby forcing the boards into place but defacing the edges of the boards. This is particularly likely to occur when the boards are formed with tongues and grooves. After the boards are forced into place a nail is driven into the joist to hold the boards in place, and later on other nails are driven through the boards and joists.

One object of the invention is to provide a machine whereby boards for floor, ceiling or sheathing may be forced into place and into contact with previously nailed boards without damage and held clamped into position until nails can be driven into the boards and into the joists.

Another object of my invention is to provide, in connection with the board holding means above referred to, means for forcing nails through the boards and into the joists.

A further object is to provide in connection with the nail driving mechanism and the board pressing mechanism joist clamps which are forced into the joists so as to hold the machine firmly in place while the board is being nailed.

Still another object of the invention is to provide, in connection with means for forcing a board in position and clamping it there, a detachable nail driving mechanism including means for feeding a nail into position and a plunger operating to force the nail out of the machine and into and through the board, and in this connection I provide

improved means for feeding the nails one by one into position in front of the plunger.

My invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation of my machine in operative position, for laying and nailing floor boards, part of the mechanism being in section. Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is a sectional view of the nail feeding channel or guide, and a top plan view of a portion of the lever 56 and the means for feeding the nails one by one into the plunger channel. Fig. 4 is a vertical section on the line 4—4 of Fig. 3. Fig. 5 is a fragmentary face view of the under side of the plunger channel, the nail supporting fingers being shown in section. Fig. 6 is a sectional view on the line 5—5 of Fig. 1.

The board pressing mechanism whereby an unnailed board is forced against a previously nailed board is fully illustrated and described in my pending application for Patent, Serial No. 19,755, filed April 7, 1915, for machine for clamping and nailing boards, of which the present application is a division. It is unnecessary therefore to describe in detail the mechanism whereby the board is forced into position to be nailed, but generally speaking it may be said that the board pressing mechanism consists of a hollow member 2 open at its opposite ends. The side walls of this hollow member are longitudinally slotted as at 6. Disposed within this hollow member 2 and reciprocally mounted therein is a plunger 20, formed at its forward end with a head 21 whose lower surface is depressed below the surface, as at 22, and it is formed with a slot 23 for the purpose of supporting a T-shaped presser head 24. This presser head is T-shaped in plan and has at its forward edge a transversely extended groove 25 adapted to receive the tongue of a floor board or like piece of timber.

Pivotally mounted upon the ears 17 are the oppositely disposed clamping jaws 31. There are two of these jaws, one on each side of the member 2 but only one of these jaws is shown in elevation in Fig. 1. Both of these jaws are of the same character and mounted in the same way. Each jaw is

straight throughout a portion of its length and then is downwardly bent at its forward end and there provided with an inwardly projecting tooth or spur 32. Each jaw is provided with a longitudinally extending slot 33, within which the corresponding ear 17 is inserted. The jaws are actuated by means of a lever 37 which is provided with pawls 30 which are gravity-actuated and engage with ratchet teeth 29 formed upon the vertical walls of the member 2. The lever 37 is pivotally connected to the jaws 31 by means of links 38, as is fully described in my pending application, so that upon a rearward movement of the lever 37 in the direction of the arrow in Fig. 1, the rear ends of the jaws will be forced inward or toward each other and forced into a joist, while upon a reverse movement of the lever 37, the prongs will be withdrawn from the joist.

As above stated, the lever is pivoted to the plunger and also pivoted to the link 38, and thus a movement of the free end of the lever toward the rear end of the machine will act to draw the link 38 rearward, thus causing the prongs of the jaws 31 to be forced into a joist and then upon a further rearward movement of the free end of the lever 37, the lever acts to carry the plunger forward, and this pushes the board B into abutting contact with the board B', and the lower extremity of the lever will cause a forward movement of the plunger 20, forcing the board into place. After the board B has been forced into position, it may be held in this position against movement by throwing the pawl 30 into engagement with the teeth 29.

After the board B has been forced into position against the board B', it is necessary to nail it to the joist as illustrated in dotted lines in Fig. 1. In order to initially nail the board B, I provide a nail engaging plunger operated by a lever 56 and a channel in which the plunger is movable, the channel opening at its lower end just above the extremity of the presser head 24, and I further provide means for feeding the nails one by one from a nail receptacle to this plunger channel.

Preferably I make the nailing attachment separable from the board pressing part of the machine so that the nailing attachment need not be used in certain situations where it could not be operative or where it is not desired to nail the boards in this manner.

With the end above described in view, I mount upon the presser head 24, which presser head is of the form shown in Fig. 2, and provided preferably with the transversely extending groove 25, the upwardly and rearwardly extending frame 45. This frame comprises the two side pieces 46

spaced from each other and connected for a certain portion of their length by a transversely extending web 47. This web toward its lower end is longitudinally slotted, as at 48^a. This slot extends down to the lower extremity of the frame and therefore opens at a point just above the cross head or cross bar of the T-shaped presser head 24. This frame is cut away as at 49 and 50, in order to reduce weight and permit access to the various parts, and pivotally mounted at the upper end of this frame upon a bolt 51 is a sector 52 whose toothed edge engages with the teeth 53 of a plunger 54. This plunger extends down in the space between the side members 46 of the frame 45, and is approximately cylindrical in cross section below the teeth 53. The plunger is guided within the frame 45 by a member 55 which is disposed between the side pieces 46, below the slot 48^a. The sector gear 52 is oscillated by means of a lever 56, which lever is pivoted upon the bolt 51 and fastened to the sector gear by means of a pin 57. It will therefore be seen that an oscillation of the lever 56 in one direction will cause a downward projection of the plunger, and that an oscillation of the lever in the other direction will cause the plunger to raise.

For the purpose of delivering nails into position within the plunger channel so that upon a downward movement of the plunger the nail may be driven, I provide a nail containing receptacle 58. This receptacle 58 is supported upon a bracket 59 projecting out from the head 24, this bracket consisting of the upper and lower members, the upper member being designated 60 and also acting as a guide for the nails, as will be later described. The bracket 59 is preferably formed of spaced parallel plates. Attached to this bracket 59 in any suitable manner are the somewhat resilient arms 61 which are preferably formed to inclose an approximate rectangle, these arms at their terminal ends being provided with outwardly directed flanges 62 through which passes a clamping bolt 63. The nail receptacle or hopper 58, as illustrated in section in Fig. 6, is formed at its lower end with a flange 64 and then extended downward as at 65, this downwardly extending portion being clasped by the arms 61. The body of the hopper is attached to the bottom thereof in any suitable manner and is preferably provided with a cover 66. The bottom of the hopper, as illustrated in Fig. 6, is transversely corrugated so as to form a plurality of valleys or depressed portions 67 with intervening rounded ridges 68. These valleys 67 are longitudinally slotted, as at 69, and the bottom extends beyond the wall of the receptacle adjacent the nail driving mechanism and being downwardly inclined. The slots 69

are continued as at 69^a, and all terminate in a common delivery slot 70. This delivery slot is in alinement with the space between the longitudinally extending spaced walls 60 of the bracket 59, so that a nail depending through the slot 70 will be guided down between the walls 60 with its head engaged over said walls. These walls 60 extend to the channel 48, as shown in Fig. 2, so that a nail passing down the guide walls 60 will eventually be discharged into the channel 48. The member 55 which forms the bottom of the channel 48, from a point just above the delivery guide 60 to the base of the machine is formed at opposite points with the upwardly directed recesses 71, (in Fig. 5) the inner faces of the frame 45 directly opposite these recesses being longitudinally recessed, as at 72. It will be seen that the recesses 71 and recesses 72 are in staggered relation to each other and that the lower wall of each of the recesses 71 is inclined, as at 73.

Mounted upon transversely extending bolts 74 and 75 are a pair of springs 76 providing upwardly and outwardly projecting spring fingers 77. These fingers are disposed normally in the slots 71 and project into the channel 48 at a point immediately opposite the end of the guide walls 60 so as to form continuations of these walls and support the head of a nail. When the plunger descends under the action of the lever 56, the plunger will strike the head of the nail and carry it downward together with the spring fingers 77. These fingers, as they move downward, are guided laterally into the recesses 72 and are thus spread apart and caused to drop the head of the nail and permit the passage of the plunger 54. Upon the upward movement of the plunger, however, the resiliency of the fingers 77 will cause them to move inward and into the upper ends of the recesses or slots 71 so as to be again disposed to receive a nail passing downward on the guide wall 60.

For the purpose of allowing the nails to pass one by one into the plunger channel, I provide the side walls of the frame 45 with the slots 78. Pivotaly mounted upon the upper face of the web 47, which connects the side walls of the frame 45, is a strip of metal 80, this strip being mounted upon the stud 81. The upper end of this strip is deflected, as at 82, and at its upper end has a flange 83 which is inclined upward and laterally so as to provide a laterally inclined surface adapted to be engaged by the upper end of the plunger 54 when the plunger is raised. The lower end of this strip is angularly bent, as at 84, then downwardly extended and again laterally bent inward as at 85, this inwardly bent blade being beveled or knife-edged as at 86. (See Fig. 3). Pivotaly mounted upon this

strip 80 by means of a stud or screw 87 is an angular member 88 having an upwardly extending arm 89 and an angularly bent portion 90 having an inwardly extending terminal end 91 also provided with a knife or beveled edge. It will be seen that the member 91 is disposed in a plane above the member 85, and that one operates in the upper portion of the slot 78 and the other in the lower portion thereof. The upper end of the arm 89 is outwardly bent to form a flange 92, this flange being notched for engagement with the terminal end of a spring 93 whose middle portion is wrapped around the pivot stud 81 and whose extremity is carried upward and engaged with the strip 80 in any suitable manner. A guide lug 94 is also formed upon the upper face of the strip adapted to engage over and act as a keeper to the upwardly extending arm 89.

With the parts arranged as before described, an oscillation of the strip 80 in one direction will cause one of the blades 85 or 91 to be disposed across the space between the members of the frame 45, that is, in the space below the guide wall 60 and above the channel 48 for the plunger 47. If now the strip be oscillated in the other direction the other one of the blades 85 or 91 will be carried in the space beneath this channel. Upon an upward movement of the lever 56 the upper end of the plunger 54 will strike the angularly deflected end 83 of the strip 80 and will oscillate the lever sufficiently to carry the member 91 into position across the slot or channel 48. Upon a downward movement of the lever, the edge of the lever will contact with the strip 80 below its pivotal point and will oscillate the strip in a reverse direction, carrying the blade 85 into position across the space between the plates of the frame 45. The operation of this nail feeding and driving mechanism is as follows: Initially the several slots 69 and 69^a and 70 are filled with nails, after which a large number of nails may be simply disposed in the hopper in any way. These nails will eventually drop into the longitudinally extending valleys 67 so that the shank of the nail will drop downward through the slots 69, the heads of the nails being supported by the walls of the slots. Under these circumstances the nails will travel down the inclined guide walls 60 until such time as the shank of the nail meets the obstructing blade 85. Assuming now that there is a nail whose head is resting on the walls of the guide 60 and whose shank is supported by the blade 85 and that there is a following nail whose head is supported upon the walls 60 and whose shank is supported against the first-named nail, then upon an upward movement of the lever the plunger engaging with the deflected end of

the strip 80 will cause an oscillation of the strip in a direction to carry the blade 85 laterally out of the nail channel and the blade 91 into the nail channel. This will
 5 release the first-named nail which will thereupon pass downward so that the fingers 77 will support the head of a nail in the plunger channel and the blade 91 will catch the second nail and support it and prevent it
 10 from following the first nail into the plunger channel. Now upon a downward movement of the lever the plunger will descend and the end of the plunger will engage the first-named nail. As the plunger descends
 15 it will contact with the side edge of the strip 80, oscillating it in a reverse direction to that of its first oscillation so as to carry the blade 85 across the space between the plates 45 and release the second nail by carrying
 20 the blade 91 outward from its obstructing position, permitting a third nail to move downward in the slot of the track and bear against the second nail now supported by the member 85. Upon an upward move-
 25 ment of the lever the blade 91 will interpose itself between the second and third nails, holding the third nail from movement, while the blade 85 will move out of its obstructing position permitting the second nail to
 30 follow the course of the first nail into the nail channel. Upon a downward movement of the plunger under the influence of the actuating lever, a nail which has previously been allowed to pass into the plunger chan-
 35 nel, as before described, will be forced downward and outward in a position inclined to the horizontal and in the direction in which the board B was forced against the board B', thus nailing the board B to the
 40 joist. It will therefore be seen that I have provided means for feeding the ordinary wire nails downward one by one into position beneath the plunger and then actuating the plunger to force the nail into the
 45 board. It will further be seen that a mechanism to this end is very simple and cannot easily get out of order.

I so construct the machine that the nailing portion of the mechanism is detachable
 50 from the board pressing portion; to provide for the use of the machine in situations where it is not desirable to nail the board or where it is not possible to do so by machinery, as for instance, in pressing ceiling
 55 boards, side and overhead sheathing boards, etc. Under ordinary circumstances, for instance where flooring boards are to be applied, and particularly where the boards are tongued and grooved, the nailing device
 60 is intended to be used.

It will of course be obvious that many changes in the details of construction may be made without departing from the spirit of my invention, and that I therefore do

not wish to be limited to the exact arrangement of parts of the exact form or mounting of the various elements of which my invention is described. 65

Having thus described my invention, what I claim is:— 70

1. In a machine of the character described, a base, joist engaging means mounted thereon, reciprocating board pressing means mounted thereon, and nailing means mounted upon the reciprocating board pressing 75 means.

2. In a machine of the character described, a base, joist engaging means mounted thereon, a reciprocating board engaging plunger mounted thereon, means for actuating the 80 joist engaging means and reciprocating said plunger, and a board nailing means mounted upon the plunger.

3. In a machine of the character described, a base, joist engaging means mounted thereon, a reciprocating board engaging plunger mounted thereon, means for actuating the 85 joist engaging means and reciprocating said plunger, and a board nailing means detachably mounted upon the plunger. 90

4. In a machine of the character described, a base, joist engaging means mounted thereon, a reciprocating board engaging plunger mounted thereon, means for actuating the 95 joist engaging means and reciprocating said plunger, and a board nailing means mounted upon the plunger, said board nailing means including a reciprocating driver, means for feeding nails successively in front of said driver, and means for reciprocating the 100 driver.

5. In a machine of the character described, a base, joist engaging means mounted upon the base for movement into and out of engagement with the joist, reciprocating board 105 pressing means mounted upon the base, means for manually actuating the joist engaging means and the board pressing means, and board nailing means carried upon the board pressing means for reciprocation 110 therewith and including a support having a driver channel extending downward and forward, a driver mounted therein, means for actuating the driver, a nail receptacle, and means for feeding nails from said nail 115 receptacle one by one into position in front of said driver.

6. In a machine of the character described, a base, joist engaging means mounted upon the base for movement into and out of engagement with the joist, reciprocating 120 board pressing means mounted upon the base, means for manually actuating the joist engaging means and the board pressing means, and board nailing means carried 125 upon the board pressing means for reciprocation therewith and including a supporting frame having a downwardly

and forwardly extending driver channel, a lever supported upon said frame and operatively engaging the driver to reciprocate it, a nail receptacle supported
 5 upon the frame, means for guiding nails from the receptacle into the driver channel, and means operated by the oscillation of said driver actuating lever for feeding nails one by one into position in front of said
 10 driver.

7. In a mechanism of the character described, a head adapted to engage the edge of a board, a frame mounted upon the head and providing a downwardly and forwardly
 15 directed driver channel opening above said head, a driver mounted in said channel, a lever mounted upon the frame, a sector gear engaging the driver and operatively connected to the lever, a nail receptacle mounted
 20 upon said frame and having a nail channel directing nails to said driver channel, means for supporting the head of the nail in said channel, and means acting upon downward movement of the driver to release
 25 the nail from its supporting means to permit a downward movement of the nail under the action of the driver.

8. In a mechanism of the character described, a board pressing head, a supporting frame extending upward and rearward therefrom and formed with a driver channel, a driver reciprocating in said channel,
 30 means for reciprocating the driver, a nail receptacle, nail guides extending from said receptacle into said channel, resilient fingers entering said channel opposite the nail guides and normally disposed within the boundary of said channel and adapted to support the head of a nail therein, and means
 40 for causing a laterally outward movement of the said fingers upon a downward movement of the driver to thereby release the nail and permit its engagement by the plunger.

9. In a machine of the character described, a board engaging head, an upwardly and rearwardly extending supporting frame having a downwardly and forwardly directed driver channel, a driver reciprocatingly mounted therein, means for reciprocating the driver, a nail receptacle, nail guides leading from said nail receptacle and leading into the driver channel, said
 50 nail guides being adapted to engage the head of a nail, means mounted upon the frame for automatically engaging with and disengaging from the shank of a nail disposed in said channel to thereby intermittently permit movement of a nail into the

driver channel, means disposed in said channel for supporting the head of a nail, and
 60 means acting upon downward movement of the driver to release the nail from its supporting means to thereby permit the downward movement of the nail with the driver.

10. In a machine of the character described, a base, oppositely disposed joist gripping jaws pivotally mounted upon the base, a plunger reciprocatively mounted upon the base, means operatively connected to the plunger and to the joist gripping jaws
 65 for actuating them, said plunger being formed at its forward end with a slotted head, a board pressing head having a portion insertible into said slot on said plunger head, said board pressing head being formed
 70 with a transversely extending groove adapted to receive the tongue of the board, and nail feeding and driving means mounted on said head.

11. In a machine of the character described, a base, oppositely disposed joist gripping jaws pivotally mounted upon the base, a plunger reciprocatingly mounted upon the base, means operatively connected to the plunger and to the joist gripping
 85 jaws for actuating them, said plunger being formed at its forward end with a slotted head, a board pressing head having a portion insertible into said slot on said plunger head, said board pressing head being
 90 formed with a transversely extending groove adapted to receive the tongue of the board, and nailing means mounted upon and reciprocating with said head.

12. In a machine of the character described, a supporting frame provided with a driver channel, a driver reciprocating therein, means for reciprocating the driver, a bracket extending outward from said frame and including oppositely disposed
 95 embracing arms, means for drawing said arms toward each other, a receptacle detachably mounted within said arms and embraced thereby, and a nail guide forming a part of said bracket and leading to the
 100 driver channel, said receptacle having a bottom formed with a plurality of longitudinally extending slots, said slots merging into each other and leading into said nail guide.
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In testimony whereof I hereunto affix my signature in the presence of two witnesses.

NICKOLAUS BINGER.

Witnesses:

F. H. SEELE,

AUG. F. LANGE.