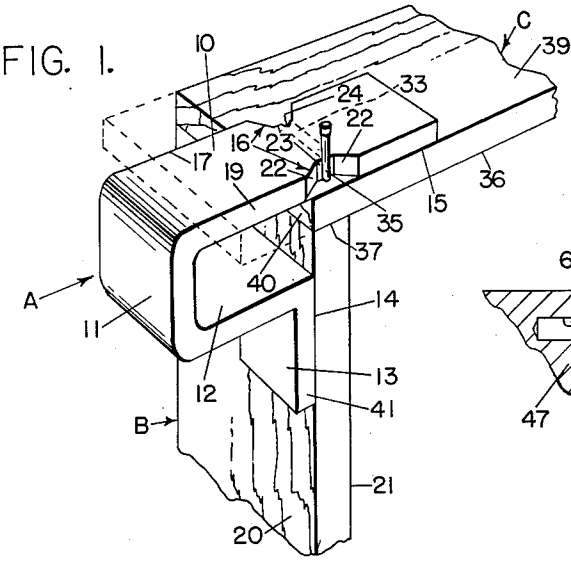
May 1, 1962 R. A. LAWSON 3,031,669

APPARATUS FOR ALIGNING, SPACING AND HOLDING CONNECTORS

Filed March 7, 1960

FIG. 1.



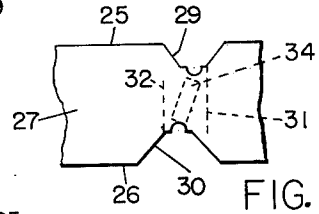


FIG. 9.

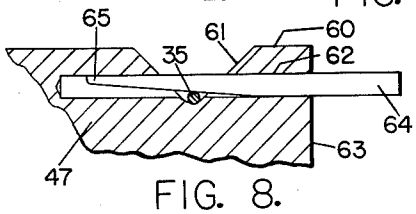
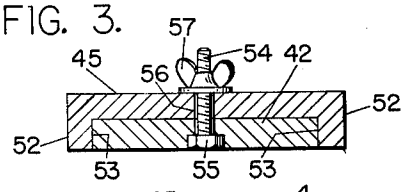


FIG. 8.

FIG. 3.



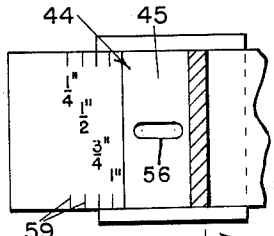


FIG. 4.

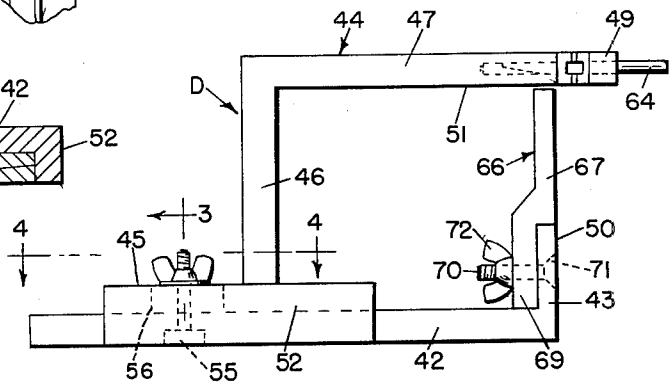


FIG. 2.

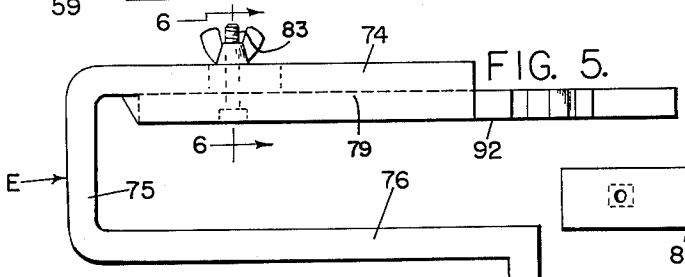


FIG. 5.

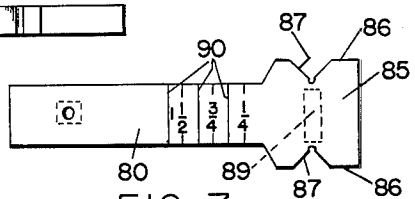


FIG. 7.

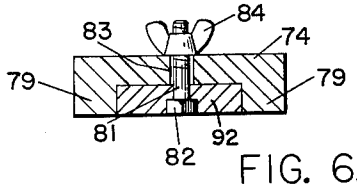


FIG. 6.

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United States Patent Office 3,031,669
Patented May 1, 1962

3,031,669
APPARATUS FOR ALIGNING, SPACING AND HOLDING CONNECTORS

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Filed Mar. 7, 1960, Ser. No. 13,121
11 Claims. (Cl. 1—49.8)

This invention relates to an improvement in apparatus for aligning, spacing and holding connectors such as nails and the like and deals particularly with a device which may be used as a guide for connecting a pair of boards or similar units in angular relation. The device is also useful in the marking or drilling of holes designed to accommodate connectors used in securing boards or the like in angular relation.

Difficulty is often experienced in securing two pieces of wood in right angular relation with the flat surface of one board abutting the end of the other. In some instances it is possible to hold one board with a clamp or similar means and then hold the second board overlying the first and at what appears to be a proper angle relative thereto. However, it is usually difficult to hold the two boards at the proper angular relation and it is also difficult to drive nails through one board and into the end of the other so that the nails go straight into the end of the second board. This difficulty is obviously increased when the thickness of the board is decreased. For example, if the boards are one-half inch or less in thickness, it is extremely difficult to properly direct the nails so that they do not split out through the surface of the wood.

The problem of properly directing the nails is also somewhat greater where the end of the first board does not terminate flush with the surface of the second. In such a case, it is necessary for the workmen to not only hold the two boards in proper relation, but also to gauge the distance from the end of the overhanging board at which the nail should be driven. It is an object of the present invention to provide an apparatus capable of materially simplifying the attachment of boards in angular relation.

A feature of the present invention resides in the provision of a tool which, in its preferred form, comprises a generally J-shaped member having an angular flange projecting from the short arm of the J in generally right angular relation or at a desired angle relative to the longer arm of the J. In the simplest form, the flange is in right angular relation to the longer arm of the J. Thus when the longer arm of the J is laid flat upon the surface of one of the boards to be connected and the flange of the J engages the surface of the second board, the two boards are in right angular relation. V-shaped notches are provided in the longer arm of the J which act as nail guides. The base of the notches are on a plane parallel to the surface of the flange and spaced therefrom a distance equal to one-half the thickness of the second board. By holding the apparatus in surface contact with the two boards, and driving a nail along the base of one of the V-shaped notches, the nail may be driven through the first board and into the center of the end of the other board until the nail penetrates a substantial distance into the second board. The clamp may then be moved and the driving of the nail may be completed.

A further feature of the present invention resides in the fact that the side edges of the apparatus are preferably on a common plane, this plane being at right angles to the plane of the surface of the long arm of the J-shaped tool body and also at right angles to the surface of the flange. Thus by holding the edge of the tool along the edge of both boards, the edges of the board will be flush.

A further feature of the present invention resides in the provision of a nail guide which may be provided with a plurality of notches on opposite sides of the long arm of the J. By partially driving a nail into the two boards in each of the opposed notches, the spacing between the nails may be regulated.

A further feature of the present invention resides in the provision of an apparatus of the type described which may include magnetic means for holding the nails in position. Magnets may be embedded in the tool at the base of each notch, the magnets holding the nails against the bases of the V-shaped notches until the nails are driven into the boards.

A further feature of the present invention resides in the provision of an apparatus of the type described which is preferably adjustable to properly center the V-shaped notches with the center of the board into the end of which the nails are to be driven. By properly adjusting the apparatus, the nails may be driven midway between the surfaces of a board of any desired thickness.

A further feature of the present invention resides in the fact that in a modified form of construction, the nails may be held against the ends of the V-shaped notches by means of a tapered wedge or dowel which may be removed or loosened to release the nail after it has been driven to the desired depth.

A further feature of the present invention resides in the fact that if desired an attachment may be provided for holding the end of one board flush with the surface of the second. This attachment may be removed when the first board is to overhang the surface of the other.

While the apparatus has been described as a nail holding device, the same apparatus is useful as a guide for drilling holes through the surfaces of one board and into the abutting end of the second. The gauge is also useful in marking the proper location for holes.

These and other objects and novel features of the present invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of the specification:

FIGURE 1 is a perspective view of the simplest form of apparatus showing the general construction thereof.

FIGURE 2 is a side elevational view of a preferred form of apparatus.

FIGURE 3 is a sectional view through a portion of the apparatus shown in FIGURE 2, the position of the section being indicated by the line 3—3 of FIGURE 2.

FIGURE 4 is a sectional view on the line 4—4 of FIGURE 2.

FIGURE 5 is a side elevational view of a modified form of construction.

FIGURE 6 is a sectional view on the line 6—6 of FIGURE 5.

FIGURE 7 is a plan view of a portion of the apparatus illustrated in FIGURE 6.

FIGURE 8 is a sectional view through a portion of the apparatus illustrated in FIGURE 2.

FIGURE 9 is a plan view of a modified form of the apparatus shown in FIGURE 1.

The nail holding and guiding apparatus A illustrated in FIGURE 1 is not adjustable and is therefore adapted for use with boards of a predetermined thickness. While the thickness of one of the boards may vary, the thickness of the other is predetermined if the nails are to be driven into the end of the second board midway between the surfaces of this board.

The apparatus A includes a generally J-shaped body portion having a relatively long upper arm 10, a relatively short connecting portion 11, and a relatively short lower arm 12. A flange 13 is secured in right angular relation with the lower arm 12 when the boards are to be secured in right angular relation. Obviously, the arm 10 extends

well beyond the surface 14 of the flange 13, and the plane of the under surface 15 of the arm 10 is preferably at right angles to the plane of the surface 14.

A pair of generally V-shaped notches 16 are provided in the parallel side edges 17 and 19 of the arm 10. The centers of these notches are on a plane parallel to the surface 14 of the flange 13 and spaced from the surface of the flange a distance equal to one-half the thickness of the board into the end of which the nails are to be driven. In other words, the centers of the notches are on a plane midway between the flat surfaces 20 and 21 of the board B when this board is resting against the surface 14. The notches 16 are preferably formed with surfaces 22 arranged on converging planes which intercept at the center plane between the surfaces 20 and 21 of the board B. In actual practice, the base of each notch is provided with a central flat portion 23 parallel to the edges 17 and 19 of the arm 10 and provided with a central vertical notch 24 which is preferably of smaller radius than the nails to be driven. As a result, the surface of each nail engages the edges of the notch 24 and thus centered with respect to the notch.

Where the apparatus A is designed for use with boards B of a single thickness, the two notches 16 may be directly opposed and may be used as a spacing guide to regulate the spacing between nails. Where the device is to be used in conjunction with boards B of two different thicknesses, the arrangement illustrated in FIGURE 9 of the drawings may be employed. In this form of construction, the sides 25 and 26 of the long arms 27, which correspond to the sides 17 and 19 of the arm 10, may be provided with V-shaped notches 29 and 30 which are not directly opposed. As an example, the center of the notch 29 may be arranged on a plane 31 which would be centrally between the surfaces of a board of perhaps three-quarter inches in thickness while the center of the notch 30 would be on a plane, indicated by the broken line 32 which would be the center plane of a board of one-half inch thickness. Thus the tool may be adaptable to boards B of two different thicknesses.

The numeral 33 indicates a magnet which may be inserted transversely in the arm 10 or may extend through a transverse aperture between the notches 16. This magnet 33 has its ends sufficiently close to the bases of the notches 16 to attract and hold the nail such as 34 against the base of each notch. As a result, the pointed ends of the nails may be engaged at the bases of the notches and held in proper position until they are driven into the wood. The arm 27 indicated in FIGURE 9 is provided with a similar magnet 34 between the notches 29 and 30. Obviously, separate magnets could be similarly used for each notch.

In use, if it is desired to secure the board C in right angular relation to the board B and with the under surface 36 of the board C abutting against the end edge 37 of the board B, the apparatus A is positioned as indicated in FIGURE 1 with the arm 10 of the device in surface contact with the upper surface 39 of the board C and with the surface 14 of the flange 13 in surface contact with the surface 20 of the board B. The end edge 40 of the board C may be flush with the surface 20 of the board B as indicated in full lines in FIGURE 1 or may overhang the board B as indicated in dotted line in FIGURE 1. The side edge 19 of the arm 10 is on a common plane with the side edge 41 of the flange 13 and accordingly the edge 19 may be positioned flush with the edge of the board 39 while the edge 41 of the flange 13 may extend flush with the edge of the board B.

The nail 35 may be placed in one or more of the notches 16 and held vertical by the magnet 33. The nail 35 may then be driven through the board C and into the end of the board B, the nail traveling on substantially a plane centrally between the flat surfaces of the board B.

FIGURES 2, 3 and 4 of the drawings disclose a modified form of construction which has certain advantages over the construction previously described. The apparatus D illustrated in these figures includes a base 42 having a flange 43 projecting upwardly therefrom at one end thereof. A generally Z-shaped arm 44 is slidably supported upon the upper surface of the base 42. The member 44 includes a horizontal flange 45 which is positioned with its under surface in face contact with the upper surface of the base 42 and which is provided at one end with an upright 46. The upright 46 supports a horizontal arm 47 which extends generally parallel to the base 42 and which is provided with an end 49 which projects beyond the outer surface 50 of the flange 43. The under surface 51 of the arm 49 is arranged on a plane in a predetermined angular relation to the surface 50 of the flange 43, and normally these surfaces 50 and 51 are in planes intersecting at right angles.

Thus in effect, the apparatus comprises a generally J-shaped structure with the arm 47 forming the longer arm of the J, and the base 42 forming the shorter arm thereof. The base flange 45 of the member 44 is provided with a pair of side rails 52 which engage against the side edges 53 of the base 42 and are thus held in alignment with the base. A bolt 54 is provided with a head 55 countersunk into the base 42 extends through a slot 56 in the flange 45 of the member 44. A wing nut 57 may be provided for holding the member 44 in adjusted relation relative to the base 42. A gauge mark 59 may be provided on the upper surface of the base 42 so as to indicate various positions of the member 44 on the base.

As indicated in FIGURE 8 of the drawings, the side edges such as 60 of the arm 47 are provided with V-shaped notches 61 similar to those previously described. A magnet such as 33 or 34 may be embedded in the arm 47 between the notches 61 or adjacent the groove thereof. However, in the particular arrangement illustrated, an aperture 62 extends longitudinally into the arm 47 from the end 63 thereof, and intersecting each notch 61 near the base of the notch. A wedge or dowel 64 having a tapered end 65 is engaged in the aperture 62. In this arrangement, the nails such as 35 are engaged in the base of one or more of the notches 61, and the dowels 64 are inserted to clamp the nail against the base of the notch. The dowels 64 are removed after the nails have been driven to the proper depth.

The apparatus D is provided with an attachment indicated by the numeral 66. The attachment 66 includes a plate 67 which may be mounted flush with the surface 50 of the flange 43 and which is provided with an offset mounting flange 69 which extends inwardly of the flange 43. A bolt 70 having its head 71 countersunk into the flange 43, is equipped with a wing nut 72 by means of which the attachment may be held in place.

The purpose of the attachment 66 is to form a shoulder designed to abut against the end edge of the horizontal board as well as the surface of the vertical board B when the end of the board C is to be secured flush with the surface of the board B. This attachment 66 is removed when the end of the board C is to overhang the surface of the board B.

The apparatus E illustrated in FIGURES 5, 6 and 7 of the drawings is very similar to the apparatus A, but is provided with a means of adjusting for different thicknesses of boards such as B. The apparatus A includes a generally U-shaped body having an upper arm 74, a vertical connecting member 75 attached to one end of the arm 74, and connecting the upper arm 74 with a lower parallel arm 76. The arm 76 is provided with a downwardly projecting flange 77 at the end thereof opposite that from which the connecting portion 75 extends.

As indicated in FIGURE 6 of the drawings, the arm 74 is provided with a pair of spaced downwardly extending guide flanges 79. An arm extension 80 is slidably supported beneath the arm 74 and between the guide flanges 79. A bolt 81 having a countersunk head 82 extends through a longitudinal slot 83 in the arm 74 and

holds the two parts in adjusted position through the use of a wing nut 84.

The arm extension 80 is provided with a head portion 85 having side edges 86 which are on the same plane as the side edges of the arm 74 and flange 77. These side edges 86 are provided with V-shaped notches 87 similar to those previously described and means may be provided for holding nails in position in these notches, this means being similar to that illustrated in FIGURE 8 or comprising a magnet 89 adjoining the base of each notch. Gauge marks 90 are provided on the surface of the extension 80 which may indicate the position of the extension relative to the arm 74 and which may position the centers of the notches 87 on a plane parallel to, and spaced from, the surface 91 of the flange 77 and which is midway between the surfaces of a board such as B held against the surface 91. This flange surface 91 is preferably in right angular relation to the under surface 92 of the arm extension 80 so that the apparatus E may function in the manner previously described in conjunction with the other forms of construction.

It will be noted that I have provided an apparatus which greatly simplifies the operation of nailing two boards together in angular relation. The apparatus accomplishes the result of holding two boards in proper right angular relation whether the end of one board overhangs the surface of the other or not. Furthermore, it provides a simple manner of holding the flush edges of the two boards in the same plane. It provides a means of holding and guiding nails so that they will be driven straight and may enter the first board in a direction normal to the surface thereof and may be driven into the end of the abutting board on a plane midway between the flat surfaces. In preferred form, the device may be adjusted to compensate for the variation in thickness of the boards into the end of which the nails are to be driven. Where desired, the apparatus may also be used to properly space the nails.

In place of providing a nailing guide, the apparatus may similarly be used as a marking means for marking the location of openings or for a drill guide for drilling apertures into the angularly related boards.

In accordance with the patent statutes, I have described the principles of construction and operation of my improvement in apparatus for aligning, spacing and holding connectors, and while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. A nail guiding device and the like including a body including a pair of generally parallel arms connected in spaced relationship, and a flange on one of said arms having a surface on a plane in right angular relation to, and intersecting, a surface of the other of said arms, the surfaces being designed to lie in face contact with a pair of boards arranged in right angular relation and nail guiding means on opposite side edges of said other arm engageable with a nail to guide said nail in a plane parallel to, and spaced outwardly from, said surface of said flange.

2. A nail guide for use in securing a pair of boards in angular relation, the boards having parallel face surfaces and right angular end edges, the guide comprising a generally J-shaped body having a longer arm and a shorter arm, the arms being spaced apart a distance greater than the board-thickness, a flange on the shorter of said arms having a surface in right angular relation to the under surface of the longer of said arms, said flange surface

being adapted to rest against the surface of one board while the under surface of the longer arm is in face contact with the other board, said longer arm including nail guide means engageable with a nail, said nail guide means directing a nail in a plane parallel to the surface of said flange and spaced therefrom a distance substantially equal to one half the thickness of the board in contact with the surface of said flange.

3. A nail guide including a pair of generally parallel arms having inner opposed surfaces, a flange on the end of one of said arms having a flat end surface in right angular relation to the inner surface of the other arm, said flange terminating in spaced relation to said other arm, a connecting member connecting said arms at points spaced from said one arm end, and a nail guide means adapted to engage the surface of a nail to guide it in a plane normal to the inner surface of said other arm and in a plane parallel to, and spaced from, the flat end surface of said flange.

4. The structure of claim 3 and including means adjustably supporting one arm relative to the other.

5. The structure of claim 3 and in which said nail guide comprises a generally V-shaped notch, and including means intersecting said notch and engageable with a nail in said notch to hold the nail in position.

6. The structure of claim 3 and in which said connecting member is slidably supported on said one arm, and including means for supporting said connecting member in adjusted position on said one arm.

7. The structure of claim 3 and in which said other arm includes a pair of arm portions in telescoping relation, and including means for holding said arm portions in adjusted relation.

8. The structure of claim 3 and including a flange extension detachably connected to said flange and extending into close proximity to said other arm, said extension having a flat surface flush with the flat end surface of said flange.

9. A nail guide including a pair of generally parallel arms having inner opposed surfaces, a flange on the end of one of said arms having a flat end surface in right angular relation to the inner surface of the other arm, said flange terminating in spaced relation to said other arm, a connecting member connecting said arms at points spaced from said one arm end, and a pair of generally V-shaped notches in opposite sides of said other arm, the bases of the notches being arranged in planes parallel to the flat end surface of said flange and spaced outwardly therefrom, the bases of said notches being normal to the inner surface of said other arm.

10. The structure of claim 4 and in which the base of one said notch is in a plane spaced farther from the flat end surface of said flange than the plane through the base of the other notch.

11. A nail guide and the like including an angular body having surfaces arranged on planes intersecting at substantially ninety degrees, one said body having a notch in an edge of one said surface, the base of the notch being on a plane spaced from, but parallel to, the other of said surfaces.

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