

UNITED STATES PATENT OFFICE.

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CLAMP.

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To all whom it may concern:

Be it known that I, HENRY F. STARRETT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Clamps, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing forming a part of this specification.

This invention relates to a clamp and more particularly to a retaining clamp which is used to secure the top or trim of a panel-board cabinet in proper position on said cabinet.

In the assembly of panel-board cabinets and similar structures the cover or trim of the cabinet must be secured in place after the required apparatus has been properly positioned in the base of the cabinet. Clamps or screws provide convenient means for securing this trim or cover in position. If a clamp is to be used it must be designed so that it can be quickly installed and so that it will securely hold the trim in the desired position.

One of the objects of this invention, therefore, resides in the production of a cabinet or trim clamp which can be quickly secured in position to hold the trim or cover in place and which presents a pleasing appearance for that portion of the clamp which extends beyond the exterior of the cabinet.

Another object of the invention resides in the production of a clamp which is fitted with means which will automatically turn the clamp into the clamping position when the clamp is tightened from the exterior of the cabinet.

A further object consists in the production of a clamp which will compensate for variations in the respective horizontal planes of the clamping surfaces, and whereby the clamp securing means extending to the exterior of the cabinet will not be shifted off-center and thereby present an unsightly appearance on the exterior of the cabinet.

An additional object of the invention resides in the production of a clamp which will consist of a few parts that can be cheaply manufactured and readily assembled.

Other objects of the invention will be ap-

parent from the following description, the accompanying illustrations and the appended claims.

For the purpose of description the preferred embodiment of the invention is illustrated in the accompanying drawings in which—

Fig. 1 is a plan view of the top portion of the cabinet with the trim clamp in position, a portion of the trim or cover being broken away to more clearly show the position of the clamp;

Fig. 2 is a transverse section of the cabinet on the plane represented by the line 2—2 showing the clamps in the clamping position;

Fig. 3 is a transverse section through the clamp proper;

Fig. 4 is a view in perspective of the clamping member;

Figs. 5 and 6 are views in perspective of the two parts of the nut; and

Fig. 7 is a plan view of the rear face of the parts of the clamp just prior to the final forming operation which interconnects the various parts of the clamp in their operating positions.

The clamp herein illustrated and described can obviously be used for a large variety of purposes, but for the purpose of description the clamp has been shown as used with the trim or cover of the ordinary commercial form of panel-board cabinet. When clamps are used for this purpose, as illustrated in the drawings, one of these clamps is ordinarily and preferably positioned in each corner of the trim.

Fig. 1 shows the top portion 8 of an ordinary commercial panel-board cabinet. Secured to this panel-board cabinet, by means of the clamps, is the cover 9 which is ordinarily fitted with a door 10, preferably hinged as at 11, so as to give access to electrical equipment positioned inside of a barrier-frame 12. The cover or trim 9 is provided with perforations at each corner to receive a screw 13 used to tighten the clamp from the exterior of the cabinet when the clamp is drawn up into its holding position, as shown in Fig. 2.

The clamp consists of the clamping member 14 which has a flat top surface 15 provided at each end with upwardly projecting

clamping surfaces 17 and 18, and with downwardly projecting parts such as 19. The top portion 15 of the clamping member is perforated at 20, and the side members are perforated as shown at 21.

Cooperating with the clamping member 14 is a two-part nut 22. The two-part nut comprises a top bowed section 23 which is fitted with a threaded perforation 24 and the projecting tangs 25 and 26. The top portion 23 is made of relatively heavy stock as compared with the lower portion of the two-part nut 27, which is constructed of comparatively light stock. The lower portion 27 of the nut is fitted with a threaded perforation 28 and with the upwardly projecting ends 29 and 30 which serve as pockets to receive the ends of the bowed portion 23, as clearly illustrated in Fig. 3.

The threaded perforation 24 of the bowed portion 23 of the two-part nut is in vertical alignment with the threaded perforation 28 of the part 27 of the nut when the two parts are assembled, as illustrated in Fig. 3. The perforations 24 and 28 of the parts 23 and 27 respectively of the two-part nut 22 are separately threaded. By thus separately threading these parts, the two-part nut, when assembled and when the perforations are in vertical alignment, is fitted with a discontinuous thread, and inasmuch as these parts are separately threaded, these discontinuous threads in the two parts are slightly displaced longitudinally. In other words, inasmuch as these parts are threaded separately, the thread in the lower part 27 does not take the exact position vertically which said thread would assume if these threads were tapped simultaneously after the nut is assembled.

The perforation in the lower part 27 of the two-part nut is made so as to throw up the metal displaced for the purpose of perforation in the form of a burr around said perforation, and this burr furnishes stock to obtain a substantial thread on the light piece of metal from which the part 27 is made.

Due to the separate threading of these two parts of the nut and the construction as shown, it will be evident that when the screw 13 is threaded into the nut, it will advance through the nut with substantially little friction through the threaded perforation 24. However, when this screw strikes the threaded perforation of the part 27, considerable resistance will be offered to the further advance of the screw 13 because of the longitudinal displacement of the threads in these two parts. This longitudinal displacement, as the screw is advanced in the part 27 is compensated for by a slight displacement between the two parts of the nut, so as to bring these threads into vertical alignment. The additional resistance offered to the advance of the screw 13 by the two-

part nut 22 is utilized to position the clamping member 14 in the clamping position, as will be hereinafter described.

In assembling the clamp, the part 23 of the two-part nut is slid into position in the part 27 of the two-part nut with the ends of the bowed portion of the part 23 resting in the upturned end pockets 29 and 30 of the part 27. This assembled nut is then positioned in the clamping member 14 before the sides 19 are bent into their final position, as is clearly illustrated in Fig. 7. When the nut is thus positioned the tangs 25 and 26 will rest in the perforation such as 21 in the sides 19 of the clamping member. When the parts of the clamp are thus assembled the final forming operation is performed which bends the sides 19 at substantial right angles to the top 15, and thereby pivotally secures the two-part nut 22 in the perforations 21 of the clamping member 14.

When the clamp is to be used for clamping the trim or cover 9 to the cabinet 8, the cover is placed in position on the cabinet 8 with the clamps in full line position 30, as indicated in Fig. 1, the clamps being secured to the underside of the cover by the screws 13, as shown in Fig. 2. When the cover or trim has thus been placed on the box of the cabinet, the screw 13 is tightened. Because of the resistance offered to the screw 13 in passing through the two-part nut, the turning of the screw 13 from the outside of the cabinet will turn with it the nut 22 and the clamping member 14. This turning movement of the nut and clamping member will continue until the end of the clamping member strikes the side of the cabinet, as indicated in dotted lines at 31 in Fig. 1. When the clamping member assumes this position further turning thereof is prevented, and the screw 13 will therefore advance through the two-part nut until the clamping member 14 is drawn tight against the flange 32 of the side of the box and the cover or trim 8, thereby securely and positively holding the trim or cover onto said flange.

As illustrated in Fig. 2 the horizontal plane of the lower surface of the cover 8 is slightly displaced from the horizontal plane of the lower surface of the flange 32. Due to this displacement of the horizontal planes on which the clamping surfaces 17 and 18 of the clamping member 14 rest, it is necessary to provide the pivotal movement between the two-part nut 22 and the clamping member 14, if the screw 13 which draws up said clamping member is to be retained in its true vertical position and not present an unsightly appearance from the exterior of the cabinet. The pivotal interconnection between the two-part nut 22, resulting from the loose positioning of the tangs 25 and 26 in the perforations 21, will permit the clamping member 14 to tilt and assume the

necessary angle from the horizontal, which is required because of the horizontal displacement of the planes on which the clamping surfaces 17 and 18 are located. This

5 pivotal interconnection permits the clamping member 14 to assume a wide range of angular displacements from the horizontal to compensate for this difference in the horizontal positions of the surfaces on which the clamping is to be effected, and thus the screw 13 used to tighten the clamp will always retain its true vertical position irrespective of the position of the surfaces on which the clamping is effected. The lower surface of the head of the screw 13, because of this compensation, will always rest flat against the top surface of the cover or trim.

In clamping the cover or trim 9 on the lower section 8 of a cabinet in which a barrier, such as 12 is used, it is ordinarily advisable to adjust the height of the barrier so that the lower surface of the frame 32, which receives the door, will rest on the top edge of said barrier when the outer edge of the cover or frame rests on the top edge of the side walls of the cabinet. When the barrier 12 is thus positioned, it acts as an additional support for the cover or trim when the cover is clamped in position on the lower portion of the cabinet 8.

It will now be evident from the foregoing description that by the use of the improved cabinet or trim clamp, as herein described, the trim or cover of a cabinet can be readily clamped into secure position on the cabinet by merely advancing the screws of the clamp positioned on the outside of the cabinet, so that the clamping member 14 of the clamp will be drawn forward and its clamping surfaces 17 and 18 drawn into firm contact with the flange on the side of the cabinet and the under surface of the trim or cover. It will also be apparent that the clamp is secured with means whereby the clamping member will automatically turn into the clamping position when the screw 13 is advanced to draw up the clamping member 14.

Further, the screw 13 will always retain its true vertical position when the clamping member 14 is drawn into its clamping position, irrespective of the displacement of the horizontal planes in which the surfaces used for clamping are positioned. The horizontal displacement of the surface used for clamping at times may be very considerable, especially in panel-board cabinet structures of the flush mounted type in which the lower section 8 of the cabinet is positioned in the wall and the cover or trim is positioned on the surface of the wall. In this type of construction, the box 8 might not be accurately positioned in the wall so that the outer edges of the side walls will be exactly flush with the wall surface and under these con-

ditions there will evidently be a very marked displacement in the horizontal planes of the surfaces on which the clamping is to be done.

Obviously, the invention is not limited to the specific embodiment thereof herein illustrated and described, but is capable of many variations and other applications within its spirit and scope as set forth in the following claims.

What I claim as new and desire to secure as Letters Patent is:

1. In a device of the character described, in combination, a clamping member, a nut secured in said clamping member, means to secure said clamping member to the surface to be clamped, said nut being provided with means to effectively increase the resistance offered to the aforesaid means after it has been introduced into said nut an appreciable distance.

2. In a device of the character described, in combination, a clamping member, a nut secured to said member, means for securing the clamping member to the surface to be clamped, and means associated with said nut whereby said clamping member and nut will turn with said securing means until the clamping member strikes an effective resistance.

3. In a device of the character described, in combination, a clamping member, a two-part nut, a screw cooperating with said nut, and threads on each part of said nut, said threads on said parts being discontinuous and separately threaded.

4. In a device of the character described, in combination, a clamping member, a two-part nut, threads on each part of said nut, the threads on one part being slightly displaced longitudinally with respect to the threads on the other part.

5. In a device of the character described, in combination, a clamping member, a two-part nut comprising a substantially heavy bowed part, and a comparatively light flat part, said flat part fitted with upturned end pockets to receive the ends of said heavy bowed part, said two-part nut being fitted with aligned threaded perforations, and means for pivotally securing said nut in said clamping member.

6. In a device of the character described, in combination, a one-piece clamping member comprising a flat top section, downwardly extending sides on said clamping member having perforations positioned in said sides, and a two-part nut pivotally secured in said perforations.

7. In a device of the character described, in combination, a one-piece clamping member comprising a flat top section fitted with upwardly protruding end clamping surfaces and downwardly extending sides having perforations positioned in said sides, a perfora-

tion in said flat section in substantial alignment with said side perforations, a two-part nut, aligned threaded perforations in said nut, and a threaded screw extending through
5 the perforation in said flat section and into the threaded perforations of said two-part nut.

8. In a device of the character described, in combination, a one-piece clamping member comprising a flat top section fitted with
10 upwardly protruding end clamping surfaces and downwardly extending sides having perforations positioned in said sides, said flat section having a perforation in substantial alignment with said side perforations,
15 a two-part nut comprising a flat nut fitted with upturned end receiving pockets and a bowed part, the ends of which ride in said pockets, said two parts of said nut being fitted with aligned threaded perforations,
20 laterally projecting tangs on said bowed part adapted to pivotally secure said two-part nut in the side perforations of said clamping member, and a threaded screw extending through the perforations in said
25 flat section and into the threaded perforations of said two-part nut.

9. In a device of the character described, in combination, a clamping member, a two-part nut secured to said clamping member having threaded perforations in each part of
30 said nut, said threaded perforations being aligned but discontinuous and slightly dis-

placed longitudinally, said clamping member being fitted with a perforation substantially larger than the perforation in said
35 nut, and a screw passing through the perforation in said clamping member and into the threaded perforation of said nut whereby said clamping member may be clamped onto
40 surfaces positioned in different horizontal planes and the screw retain its true vertical position, said clamping member and nut turning with said screw when said screw enters the thread of the second part of said
45 nut, said turning continuing until said clamping member strikes an effective resistance.

10. In a device of the character described, in combination, a clamping member, a two-part nut comprising a flat part fitted with
50 upturned receiving pockets, and a bowed part the ends of which ride in said pockets, said two parts of said nut being fitted with aligned threaded perforations, the perforation in the flat part of said nut resulting in
55 an upturned burr to provide additional stock for threading purposes, lateral tangs on said bowed part of said nut, and means provided in said clamping member to pivotally secure
60 said nut by means of said tangs in said clamping member.

In witness whereof, I have hereunto subscribed my name.

HENRY F. STARRETT.