Dec. 26, 1961 C. F. PEARL 3,014,258

CLAMPING DEVICES

Filed June 16, 1960

FIG. 2

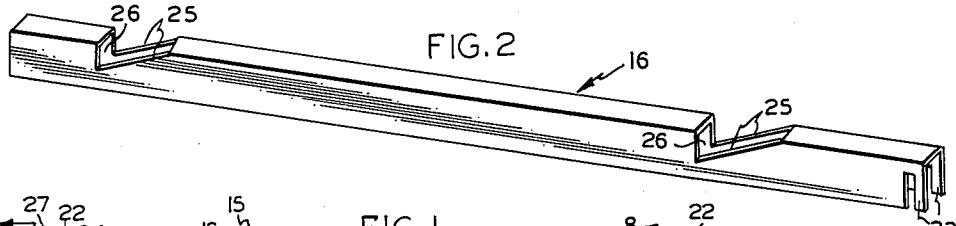
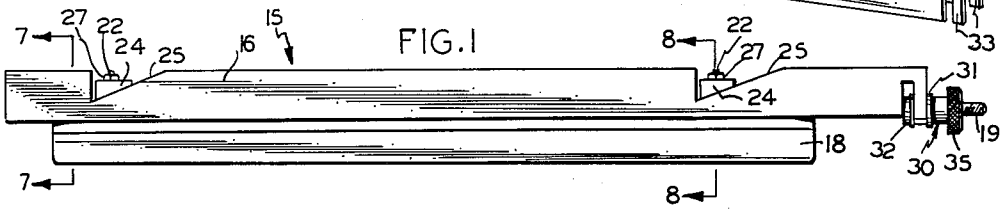


FIG. 1



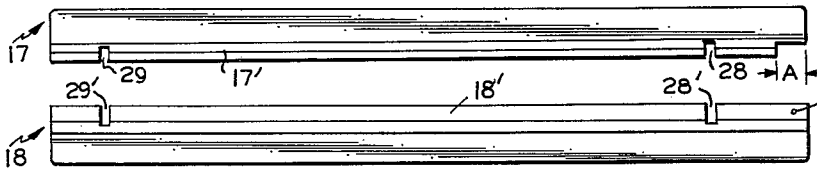


FIG. 3

FIG. 4

FIG. 5

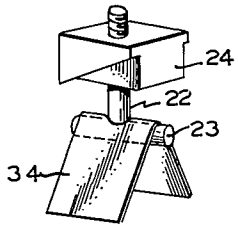


FIG. 6

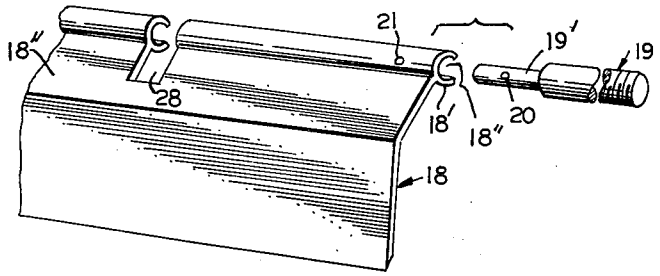
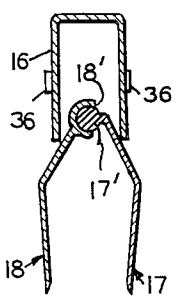


FIG. 7



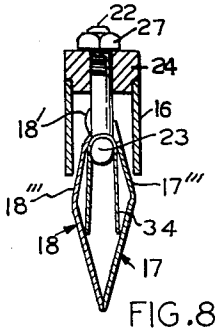


FIG. 8

INVENTOR,
CURTIS F. PEARL,
BY
ATTORNEY.

United States Patent Office 3,014,258 Patented Dec. 26, 1961

3,014,258

CLAMPING DEVICES

Curtis F. Pearl, West Englewood, N.J., assignor to Stacor Equipment Company, Newark, N.J., a firm

Filed June 16, 1960, Ser. No. 36,542
7 Claims. (Cl. 24—251)

The present invention relates to a clamp for sheet material which for example can be used to bind a number of drawings, maps, and the like and then, if desired, suspend them on suitable supports or in a suspension file or such device can be used to suspend a rug for display or hang curtains and drapes, and more particularly this invention is concerned with that type of clamping device in which two hinged, opposite clamping jaws extend from within a channel therealong and arranged so that movement of said jaws into the channel causes them to approach each other and movement thereof out of said channel causes such jaws to move apart.

Heretofore, clamps of this class when of relatively long dimension required manual manipulation near each end region at the least, consisting usually of turning nuts on bolts in order to close the clamp tightly along its entire length or to effect opening of the clamp.

It is therefore the principal object of this invention to provide a novel and improved clamping device of the character mentioned, of any length and operable from but a single point thereon which preferably is at an end thereof and yet effect proper clamp and release.

A further object thereof is to provide a clamping device of the nature set forth, which is simple in construction, reasonably cheap to manufacture, easy to use and efficient in carrying out the purposes for which it is designed.

Other objects and advantages will become apparent as this disclosure proceeds.

For the practice of this invention, one form it may assume is to have a clamp protruding from the interior of a channel member and so formed that it will cooperate with the opposite walls of the channel to be cammed to close when drawn into said channel. A spring means is provided to bias the clamp blades to open. The channel member is provided with a cam formation cooperating with a cam follower which suspends the clamp within the channel. Cam action is such that upon movement of the clamp along the channel in one direction, said clamp will be drawn into the channel and upon movement of said clamp in the opposite direction along the channel, the clamp will move in a direction outwardly from the channel, whereupon the spring will cause the clamp to open. An operable member, preferably at one end of the channel, is included for selectively effecting longitudinal movement of the clamp in either direction along said channel. This operable member may be a nut journalled on the channel and engaging a threaded shank extending along the channel from one of the clamp's pivotally associated blades or jaws. Upon turning said nut, the threaded shank will slide.

In the accompanying drawing forming part of this specification, similar characters of reference indicate corresponding parts in all the views.

FIG. 1 is a front elevational view of a preferred embodiment of a clamping device in accordance with this invention. Here, the clamping means is in "open" condition.

FIG. 2 is a perspective view showing the channel member which serves as the frame on which the remaining components are associated.

FIGS. 3 and 4 are outer surface views of the clamping blades respectively.

FIG. 5 is a perspective view of the means used to suspend the clamping means within the frame channel member and a spring means to bias the clamp to open.

FIG. 6 is a composite fragmentary perspective view showing one of the clamping blades or jaws and an associated screw.

FIG. 7 is a section taken at line 7—7 in FIG. 1, slightly modified by having rails on the channel member to enable the device to be mounted in a filing rack support bracket.

FIG. 8 is a section taken at line 8—8 in FIG. 1, but showing the clamping means in "closed" condition.

The FIGS. 5–8 are drawn to an enlarged scale.

In the drawing, the numeral 15 designates generally a clamping device comprising an elongated channel 16, into which partly extends the hinged end of two opposite, elongated clamping blades or jaws 17 and 18 which are along the channel. Such hinge structure may be of any suitable form, but preferred is the one shown where the cylindrical rod 17', integral with and along an edge of the blade 17, cooperates with the lengthwise-slotted tubular formation 18' which is integral with and along an edge of the blade 18. Said rod part 17' is rotatably fitted in part 18' and retained therein because said part 18' envelops more than a half circle of said rod part 17'. It is evident that assembly of these blades is effected by longitudinal movement of the rod part 17' into the opening 18''. One end of said rod part 17' is cut away for a distance "A" so that the reduced end 19' of the screw 19 can be entered into the vacant end region thus afforded in the slotted tube 18' and then secured to the blade 18 by means of a pin or screw positioned through the holes 20, 21. The clamp formed by said blades 17, 18 is supported near its ends on the shanks 22 by having each such shank with a head 23 which lies between the clamping blades and supports the hinge structure; each of said shanks carrying a cam follower 24 which rides on the inclines 25 serving as the cam means formed in the channel member 16 by the cut-outs 26. At the other end of each shank 22 is a stop element which may be a nut 27 in threaded engagement with the shank. Clearance for the shanks 22 through the clamp structure is provided by the related cut-outs 28, 28' and by the related cut-outs 29, 29 in the respective blades 17, 18. The screw 19 at its exposed end carries the operating nut 30 which is journalled to the channel 16. The numerals 31, 32 denote shoulders on said nut which cooperate with the fingers 33 to permit said nut only rotary movement in relation to the channel member 16. On each shank 22, between the clamping blades 17, 18, a stressed bow spring 34 is carried to bias the clamp to open.

The hinge structure joining the clamping blades 17, 18, is midway between and spaced from the side walls of the channel member 16. The outer surfaces 17''' and 18''' of the blades 17, 18 diverge in a direction out of the channel 16 and for some distance outward of said channel and always contact respectively the distal longitudinal edges of said channel, which act as cams to close the clamp when said blades 17, 18 comprising the clamp, are drawn into the channel. The blades 17, 18 are of such form that when drawn into the channel 16, their free longidutinal end regions come into contact with each other. It is advisable that each blade be bent lengthwise to be of angle section as shown.

To use the device 15, take it in its condition as shown in FIGS. 1 and 7. Insert sheets between the separated blades 17, 18 and turn the knob 35 which is an integral part of the nut 30, whereby the blades are shifted towards the right in FIG. 1. The cam followers 24 will ride up the cams 25, thereby drawing said blades 17, 18 into the channel 16, causing them to approach each other until they clamp the sheets inserted between them. The movement of the blades will cause the springs 34 to be-

come further stressed or to become stressed if they were not. Turning the knob 35 in the opposite direction, will cause the clamping blades 17, 18 to move toward the left in FIG. 1, whereupon the cam followers 24 will ride down the cams 25 and the action of the springs 34 will cause the clamp to open.

Of importance to note is that the device 15 is workable from a single point of control, namely by the turning of the knob 35, which when at the end of the device as shown, is readily accessible even when such devices are carried on filing racks which may support the channel 16, by for instance, having along the side walls of the channel the rails 36 which are received into channeled brackets on fixed framework, as is well known in the art and needs no further illustration. It is evident and well known to suspend the channel member 16 near its ends by having same across two raised spaced bars.

These devices 15 are usually comparatively long and require at least two shanks 22 and its associated mechanism for their clamping blades to operate properly. Of course, when the clamp is short, a single suspension means and its related mechanism would be sufficient, but the adaptation for use in comparatively long clamps is most practical for this invention.

This invention is capable of numerous forms and various applications without departing from the essential features herein disclosed. It is therefore intended and desired that the embodiment shown herein shall be deemed illustrative and not restrictive and that the patent shall cover all patentable novelty herein set forth; reference being had to the following claims rather than to the specific description herein to indicate the scope of this invention.

I claim:

1. In a device of the character described, a channel frame, a clamp comprising two opposite gripping members; said members and the opposite walls of the channel frame having complemental camming surfaces which cause said members to move towards each other and grip an object placed therebetween when drawn into the channel, cam means on the channel frame, means supporting said clamp in the channel and cooperating with said cam means as the follower thereof; said clamp being drawn into the channel upon relative movement in one direction along the channel of said cam and follower means, and an operator means on said device to selectively cause relative movement of said cam and follower means in said one direction and in the opposite direction along the channel.

2. A device as defined in claim 1, wherein the operator means is positioned at an end of the device.

3. A device as defined in claim 1, wherein said cam means is an incline with respect to the line of extension of the channel depth; the cam follower being in contact with said incline and free for movement along the channel with the clamp; said follower means upon operation of said operator means being caused thereby to move along the channel.

4. A device as defined in claim 3, wherein said incline is offered by an edge of a cut-out in a wall of the channel; said edge supporting the cam follower.

5. An article as defined in claim 3, wherein the incline is offered by corresponding edges of opposite cut-outs, one in each of the opposite walls of the channel; the cam follower being supported by both said edges.

6. A device as defined in claim 3, wherein the operator means comprises a nut journalled on the channel frame and a screw extending from the clamp in threaded engagement with said nut.

7. A device as defined in claim 6, wherein said nut is at an end of the channel frame.

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