

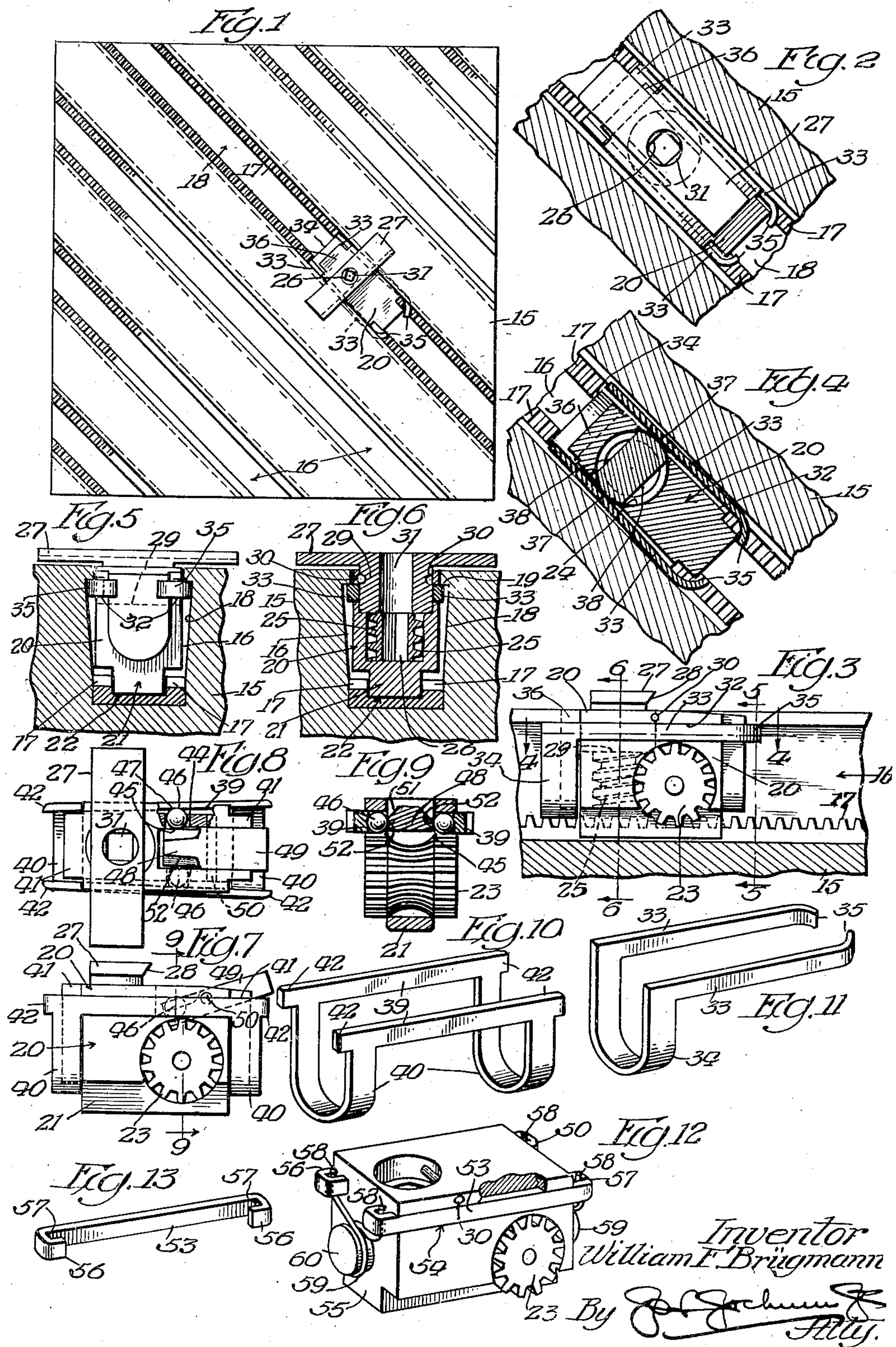
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PRINTING PLATE MOUNTING

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## UNITED STATES PATENT OFFICE

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## PRINTING PLATE MOUNTING

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This invention relates to improvements in printing plate mountings, and more particularly to devices of the character which operate in grooves, and in which grooves racks are provided with which advancing and controlling means carried by the mounting engage, and through the medium of which advancing means a micrometer adjustment of the device may be obtained.

Heretofore mountings or clamps of this character have generally been secured against raising out of the groove by means of devices operating under an overhanging portion of the wall of the groove, some of which have heretofore been held in the grooves by spring actuated devices which recede as they are inserted and expand after insertion to project under such overhanging portions. A tool has then been used to compress the expanded portions so as to permit the clamp or mounting to be raised out of the groove.

While some good results have been obtained with such a type of device, the use of the same has not been entirely satisfactory, due partially to the uncertainty of the expanding action and the slowness of the inserting and extracting operations.

To overcome these difficulties and objections and to provide an improved mounting or clamp of this character in which the locking elements are normally maintained retracted or inactive, whereby the device may be inserted entirely into and seated within the groove, after which the locking means will be expanded by a positively actuating expanding element, is one of the objects of the present invention.

A further object is to provide improved locking means in a device of this character adapted to be expanded when the device is inserted within the groove in a mounting base, portions of the locking elements being arranged adjacent each end of the clamp or mounting, and which locking elements when separated or expanded will expand at the forward end of the mounting first and to a greater extent than at the rear end, thereby insuring a full hold at the plate engaging end where the greatest stress or strain of the plate thereupon is exerted, and at the same time the forward end of the locking means will be resilient, so that if during the advancement of the mounting or clamp device an uneven side wall or obstruction is encountered, the locking means will yield and adapt itself to such condition, by rocking upon the expander element as a fulcrum, and with respect to the body of the mounting or clamp device.

A further object is to provide in a device of this character improved locking elements, the device

being so constructed that the locking elements will have a double action, that is a torsion action is imparted to a portion of the mechanism when the locking elements are rocking upon the expander element as a fulcrum, and also a retracting movement will be given to the elements so that they will be drawn back to their normal positions.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawing illustrating this invention, and in which

Figure 1 is a top plan view of a portion of a mounting base, with a mounting or clamping device constructed in accordance with the principles of this invention, secured in position with respect thereto.

Figure 2 is a top plan view of one form of mounting device or clamp, showing the same in an unlocked position within a groove in the mounting base.

Figure 3 is a vertical sectional view through one side of one of the grooves showing the mounting or clamp device in side elevation.

Figure 4 is a detail, horizontal, sectional view taken on line 4—4, Figure 3.

Figure 5 is a detail, vertical, sectional view taken on line 5—5, Figure 3.

Figure 6 is a detail, vertical, sectional view taken on line 6—6, Figure 3.

Figure 7 is a side elevation of another form of mounting or clamp device.

Figure 8 is a top plan view of Figure 7, with parts broken away, and parts in section.

Figure 9 is a vertical, sectional view taken on line 9—9, Figure 7, but with the locking lever in a locking position.

Figure 10 is a detail perspective view of the form of locking element shown in Figures 7 to 9, inclusive.

Figure 11 is a perspective view of the locking element shown in Figures 1 to 6, inclusive.

Figure 12 is a detail perspective view, partly broken away, partly in section, and with parts omitted, of another form of locking device or clamp.

Figure 13 is a detail perspective view of one of the locking elements of the form of the invention shown in Figure 12.

Referring more particularly to the drawing, the numeral 15 designates a mounting base provided



with grooves 16 therein preferably arranged diagonally thereacross. Within each of the grooves and preferably adjacent each side wall thereof racks 17 are arranged, and these racks extend substantially throughout the entire length of the grooves and may, if formed separately, be secured in the grooves in any desired or suitable manner. If, however, the grooves are integral with the base, they may be formed in any desired or suitable manner.

The side walls 18 above the racks may be vertical or slightly inclined, if desired, and the base adjacent the upper end of the groove is preferably undercut to form shoulders or portions 19 which overhang the groove, and beneath which shoulders locking elements on the mounting or clamp device are adapted to be projected for securing the clamp device against accidental vertical movement out of the groove.

The mounting or clamp device consists essentially of a body portion 20 which is preferably reduced as at 21 at the base thereof, and the reduced portion preferably moves in a groove or space 22 formed between the racks 17. The bottom of the reduced portion 21 may rest upon the bottom of the space 22 or may terminate short of the bottom of the space so that the clamp device will be supported by the advancing and retracting means to be hereinafter described.

Within the body 20 is arranged a transverse opening extending entirely therethrough for the reception of the advancing and propelling means, which latter consists of an element provided with portions 23 shaped to form gears on the opposite sides of the body, and these gears 23 mesh with the respective racks 17 in the bottom of the groove, and may serve as a means for supporting the clamp device.

The body 20 is also provided with an upwardly opening recess 24 in which is arranged a worm 25 which rotates about an upright axis, and this worm 25 meshes with a worm that is connected with the gears 23 to form a portion of that element, as is well known in this art.

The worm 25 is provided with an opening 26 therein that is angular in cross section and is adapted to receive a tool through the medium of which the worm 25 may be rotated, to rotate the gears 23 and thereby advance or retract the clamp device 20, according to the direction of rotation of the worm 25.

A plate engaging element 27 having a beveled or inclined edge 28 is provided with a depending circular portion 29 adapted to project into an enlarged portion in the recess 24 so that one end will abut the worm 25 to hold the latter in position. The plate engaging element 27 is rotatably secured to the body 20 preferably by means of fastening pins 30, well known in this art. When the clamp is mounted within the groove 16, the lower face of the plate engaging member 27 will be disposed in close proximity to the upper face of the base 15 and is freely rotatable across such face.

The plate engaging member 27 is provided with an opening 31 therethrough which registers with the opening 26 in the worm 25, but is preferably of a diameter greater than the diameter of the opening 26. This opening 31 is preferably circular in cross section so that when a tool is inserted through the opening 31 into the opening 26 of the worm 25, the rotation of the tool will not be interfered with and the worm 25 may be rotated independently with respect to the plate en-

gaging member 27 or the projecting portion 29 thereof.

The side walls of the body 20 adjacent the upper edges thereof are recessed as at 32, and these recesses extend for substantially the entire length of the body portion.

Locking elements 33 which extend substantially throughout the length of the body portion are seated within these recesses 32. One end of the locking elements 33 are connected together by a substantially U shaped spring portion 34, while the other extremities of the elements 33 are preferably bent or curved inwardly as at 35 to project over one end of the body portion 20, as shown clearly in Figures 2 and 4.

The opposite end of the body portion 20 is cut away or reduced as at 36, and the spring portion 34 of the locking elements engages over the reduced portion 36, and this portion 36 is of such a size as not to interfere with the contraction or expansion of the spring portion 34.

The recesses 32 are of a depth to intersect the opening in the body portion 20, as shown more clearly in Figures 4 and 6, and the portion 29 adjacent such intersection is of a diameter to extend through the intersecting opening to contact with the adjacent faces of the locking elements 33, as shown in Figure 4, at 37, and opposite faces of the portion 29 of the plate engaging elements 27 are cut away as at 38 to form flat faces. The intersecting openings between the recesses 32 and the opening 24 in the body of the clamp are preferably arranged adjacent one end of the body portion and in proximity to the resilient U shaped connection 34 between the locking elements 33.

With this construction it will be manifest that when the plate engaging element 27 is disposed in the position shown in Figure 1 with respect to the body portion 20, the projecting surfaces of the portion 29 of the plate engaging element will engage the faces of the locking elements 33 and separate or expand them, but when the flat surfaces 38 are arranged substantially parallel with the locking elements 33, the inherent resiliency of the element 34 will cause the locking elements 33 to be retracted or moved towards each other.

It will also be manifest that with this construction and when the plate engaging element 27 is rotated to move the locking members into the position shown in Figure 4, the forward extremities 35 of the locking elements will be separated in advance of the other ends which are connected by the resilient element 34 to cause the locking elements to be moved beneath the shoulders 19 of the groove 16. This will insure a firm and positive locking of the clamp device against vertical movement in the groove 16, at the point where the greatest stress or strain is exerted by the printing plate.

With this construction and with the parts shown in the position in Figure 4, it will also be manifest that when the clamp device is advanced in the groove 16 after it has been locked within the groove, in the event that a projection or unevenness on the side walls of the groove is encountered, the forward ends of the locking elements 33 will yield and will rock about the contact point 37 with the portion 29 as a fulcrum so as not to interfere with the advancement of the clamp device, yet at the same time the locking action of these elements 33 will not be interfered with. This construction also operates to impart a torsion action to the resilient means which connects these elements resulting in two different



kinds of action, that is a torsion action as well as an expanding and retracting action.

In inserting the device into the groove, the plate engaging element 27 is moved to the position shown in Figure 2 with respect to the body 20, and the device may then be dropped into the groove 16 in the base 15. The device may then be locked in position by rotating the plate engaging element 27, causing the elements 33 to be expanded or separated and to move under the shoulders 19. For a micrometer adjustment of the clamp device the worm 25 is rotated by means of a tool inserted through the opening 31.

To release and remove the clamp, it is only necessary to rotate the plate engaging element 27 back to the position shown in Figure 2, when the device can then be freely raised and removed through the top of the groove.

In the form of the invention shown in Figures 7 to 10, similar locking elements 39 are provided which are seated in similar recesses in the outer faces of the body 20. Substantially U shaped resilient connections 40 are provided between the respective ends of the elements 39 and these U shaped portions 40 extend around reduced portions 41 at the ends of the body 20. The extremities 42 of the elements 39 preferably project beyond the respective elements 40 and are preferably rounded so as not to interfere with the advancement or retraction of the clamp device. Openings 44 (see particularly Figure 8) are provided in the side walls of the recess 45 in which the portion 29 of the plate engaging element 27 is located, and in these openings 44 balls 46 are disposed, and the diameter of the balls is such that they will project beyond both faces of the walls of the recess 45 to be seated in seats or recesses 47 in the adjacent face of the locking elements 39. These balls also project into the recess 45 to be engaged by a cam shaped portion 48 on the end of a lever 49, which latter is pivotally mounted as at 50.

This cam shaped portion 48 is preferably in the form of a wedge having inclined surfaces 51 and a straight or flat portion 52. The inherent resiliency of the elements 40 tend to draw the locking members 39 towards each other and this resiliency forces the balls 46 inwardly to contact with the inclined surfaces 51 of the cam shaped portion 48 when the end of the lever 49 is raised to the position shown in Figure 7. When, however, the end of the lever is depressed, the inclined surfaces 51 will be raised, thereby separating the balls 46 and forcing the locking elements 39 away from each other so that they will project under the shoulders 19 in the groove 16. The flat portion 52 of the cam element 48 will then be moved into a position that the balls 46 will rest thereagainst so as to hold the locking elements 39 separated.

In this form of the invention it will be manifest that when the lever 49 is in the position shown in Figure 7, the locking elements 39 will assume their normal retracted position. The clamp may then be inserted in the groove and moved to the desired position. The free end of the lever 49 is then depressed and the locking elements 39 will be forced under the shoulders 19 of the groove 16. After this a micrometer adjustment may be obtained in the same manner as in the form of the invention described in connection with Figures 1 to 4. When it is desired to remove this form of the clamp, it is only necessary to raise the free end of the lever 49 and the clamp may then be readily removed from the groove.

In the form of the invention shown in Figures 12 and 13, the locking elements 53 are separate from each other and are seated within grooves 54 in the body portion 55. These locking elements project beyond the ends of the body portion and are provided with inturned extremities 56 to form grooves or seats 57 for the reception of the extremities 58 of a coiled spring 59 which operates as a retraction spring. The convolutions of the spring are coiled about a projection 60 on the respective ends of the body portion 55. In this form of the invention, the locking elements 53 will be separated against the stress of the springs 59 by the rotation of the plate engaging element 27, in a manner similar to the form shown in Figures 2 and 4. When the locking elements 53 are forced outwardly against the stress of the ends 58 of the spring 59, they will be projected under the shoulders 19 of the groove 16, but when the projecting means for the locking elements 53 is released or positioned so as to permit the locking elements 53 to be moved inwardly, such movement will be accomplished by the action of the springs 58—59.

In each form of the invention the locking elements which project under the shoulders 19 will not engage the side walls of the groove 16 and for this reason a rocking movement may be effected so as to permit them to pass obstructions on the side walls. It will further be manifest that in all forms of the invention the locking of the clamp is effected through a positive projecting of the locking elements against the stress of a retracting spring, with the result that spring action is not relied upon to effect such a locking.

While the preferred forms of the invention have been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. A printing plate clamp comprising a body insertable into a groove in a mounting base, a pair of transversely movable locking members mounted thereupon and capable of being spread apart to lock said clamp in said groove, means normally retracting said members, means for separating said members against the stress of said retracting means, and means mounting said locking members for movement about said separating means as a fulcrum.

2. A printing plate clamp embodying a body portion, laterally and bodily movable locking members extending along the sides of said body, resilient means connecting and forming an integral part of the said members at one end and operating to normally retract said members, and means operating between said members for separating them.

3. A printing plate clamp embodying a body portion, laterally and bodily movable locking members extending along the sides of said body, resilient means connecting the said members at one end and operating to normally retract said members, and means operating between said members for separating them, said body being reduced at one end, said resilient means comprising a spring element engaging and extending about said reduced end.

4. A printing plate clamp embodying a body portion, laterally and bodily movable locking members extending along the sides of said body, resilient means connecting said members ad-



adjacent the end thereof and operating to normally retract said members, separating means operating between said members to move them against the stress of said retracting means and about which separating means said members are adapted to move as a fulcrum.

5. A printing plate clamp embodying a body portion, laterally and bodily movable locking members extending along the sides of said body, resilient means connecting said members adjacent the end thereof and operating to normally retract said members, separating means operating between said members to move them against the stress of said retracting means and about which separating means said members move as a fulcrum, said separating means also operating to impart a torsional movement to said members.

6. A printing plate clamp embodying a body portion, laterally and bodily movable locking members extending along the sides of said body, resilient means operating to normally retract said members, and actuating means operating between said members at points spaced from the ends of the members to separate them, the forward ends of said members being laterally yieldable and movable upon said actuating means as a fulcrum.

7. A printing plate clamp embodying a body portion, laterally and bodily movable locking members extending along the sides of said body, resilient means operating to normally retract said members, and actuating means operating between said members at points spaced from the ends of the members to separate them and impart a torsional movement to said resilient means, the forward ends of said members being laterally yieldable and movable upon said actuating means as a fulcrum.

8. A printing plate clamp embodying a body portion, laterally and bodily movable locking members at the sides and extending lengthwise of said body, resilient means operating to normally retract said members, and means embodying a cam device mounted for movement about a fixed horizontal pivot and operating between said members for separating them against the stress of the said resilient means.

9. A printing plate clamp embodying a body portion, laterally and bodily movable locking members at the sides and extending lengthwise of the said body, resilient means operating to normally retract said members, and a separator operating between said members to separate and move them into locking positions, the forward ends of said members being laterally yieldable when in locking position.

10. A printing plate clamp embodying a body portion, laterally and bodily movable locking members at the sides and extending lengthwise of the said body, resilient means operating to normally retract said members, and a separator operating between said members to separate and move them into locking positions, the forward ends of said members being laterally yieldable when in locking position, said separator embodying a cam element movable between the said members on a fixed horizontal pivot.

11. A printing plate clamp embodying a body portion, laterally and bodily movable locking members at the sides and extending lengthwise of the said body, resilient means operating to normally retract said members, a separator operating between said members to separate and move them into locking positions, the forward ends of said members being laterally yieldable when in

locking position, said separator embodying a cam element movable between said members, and an actuating lever mounted to swing upon a fixed horizontal pivot and to which lever said cam element is connected.

12. A printing plate clamp embodying a body portion, laterally and bodily movable locking members extending along the sides of said body, resilient means connecting the said members at one end and operating to normally retract said members, and means operating between said members for separating them, the forward ends of said members extending beyond the adjacent end of said body and being rounded or curved.

13. A printing plate clamp comprising a body portion, locking means embodying locking members at the sides and extending lengthwise of the body, means normally retracting said members, and means for imparting laterally separating and torsional movements to said locking means.

14. A printing plate clamp comprising a body portion, locking means embodying locking members at the sides and extending lengthwise of the body, means normally retracting said members, and means for imparting laterally separating and torsional movements to said locking means, one end of said members when in locking position being laterally yieldable.

15. A printing plate clamp comprising a body, locking members extending lengthwise of the body and projectable beyond the sides thereof into locking position, means operating to normally retract said members, the forward ends of said members when in locking position being laterally yieldable.

16. A printing plate clamp embodying a body, laterally and bodily movable locking members extending lengthwise of the body and projectable beyond the sides thereof into a locking position, resilient means connecting said members and tending normally to retract them, and a separator operating between said members to project them into locking position and to separate one end thereof to a greater extent than the other end.

17. A plate printing clamp embodying a body portion, laterally and bodily movable locking members extending along the sides of said body, downwardly extending resilient means connecting said members and operating to normally retract them, and means operating between said members and in a direction transverse to the length of said members for separating them.

18. A printing plate clamp embodying a body portion, laterally and bodily movable locking members extending along the sides of said body, resilient means operating to normally retract said members, and actuating means operating between said members at points spaced from the ends of the members to separate them and impart a torsional movement to said resilient means, both ends of said members being laterally yieldable and movable upon said actuating means as a fulcrum.

19. In a printing plate clamp, a body insertable into a groove in a mounting base, a locking element movable transversely with respect to the longitudinal diameter of the body, means normally retracting said element, and means movable in a plane along the longitudinal axis of said body and upon a horizontal pivot for projecting said element beyond the side of said body and against the stress of said retracting means.

20. A printing plate clamp embodying a body portion, a laterally and bodily movable locking member extending along the side of said body,



means operating to normally retract said member, and means operable upon said member and mounted upon a horizontal axis transverse to the longitudinal diameter of the said body, to project the said member beyond the side of said body and against the stress of the first said means.

21. In a printing plate clamp, a body insertable into a groove in a mounting base, a locking member projectable beyond the side of said body, means operating normally to retract said member, and means operable in a plane transverse to the longitudinal axis of said body for projecting said member beyond the side of the body, a portion of the last said means being accessible at the top of said body, the said portion embodying an element movable about a horizontal pivot and adapted to be positioned substantially flush with the top of said body when the said locking member is projected.

22. In a printing plate clamp, a body insertable into a groove in a mounting base, a locking member carried by and projectable beyond the side of said body, means operating normally to retract said member, and means for projecting the said member beyond the side of the body, means mounting the last recited means whereby a portion of the last said means will be disposed adjacent and adapted to be moved out of and substantially into the plane of the top of said body and about a horizontal pivot.

23. In a printing plate clamp, a body insertable into a groove in a mounting base, a locking mem-

ber carried by and projectable beyond the side of said body, means operating normally to retract said member, and means mounted for movement about a horizontal pivot for projecting the said member beyond the side of the body, a portion of the last said means being disposed adjacent and movable out of and substantially into the plane of the top of said body.

24. A printing plate clamp embodying a body portion, laterally and bodily movable locking members extending along the sides of said body, resilient means connecting the said members at both ends thereof and operating to normally retract said members, and means operating between said members for separating them.

25. A printing plate clamp embodying a body portion, laterally and bodily movable locking members extending along the sides of said body, a vertically disposed substantially U shaped spring connecting the said members at one end and operating to normally retract said members, and means operating between said members for separating them.

26. A printing plate clamp embodying a body portion and bodily movable locking members extending along the sides of said body, a vertically disposed and substantially U shaped spring arranged adjacent and connecting the said members at each end and operating to normally retract said members, and means operating between said members for separating them.

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