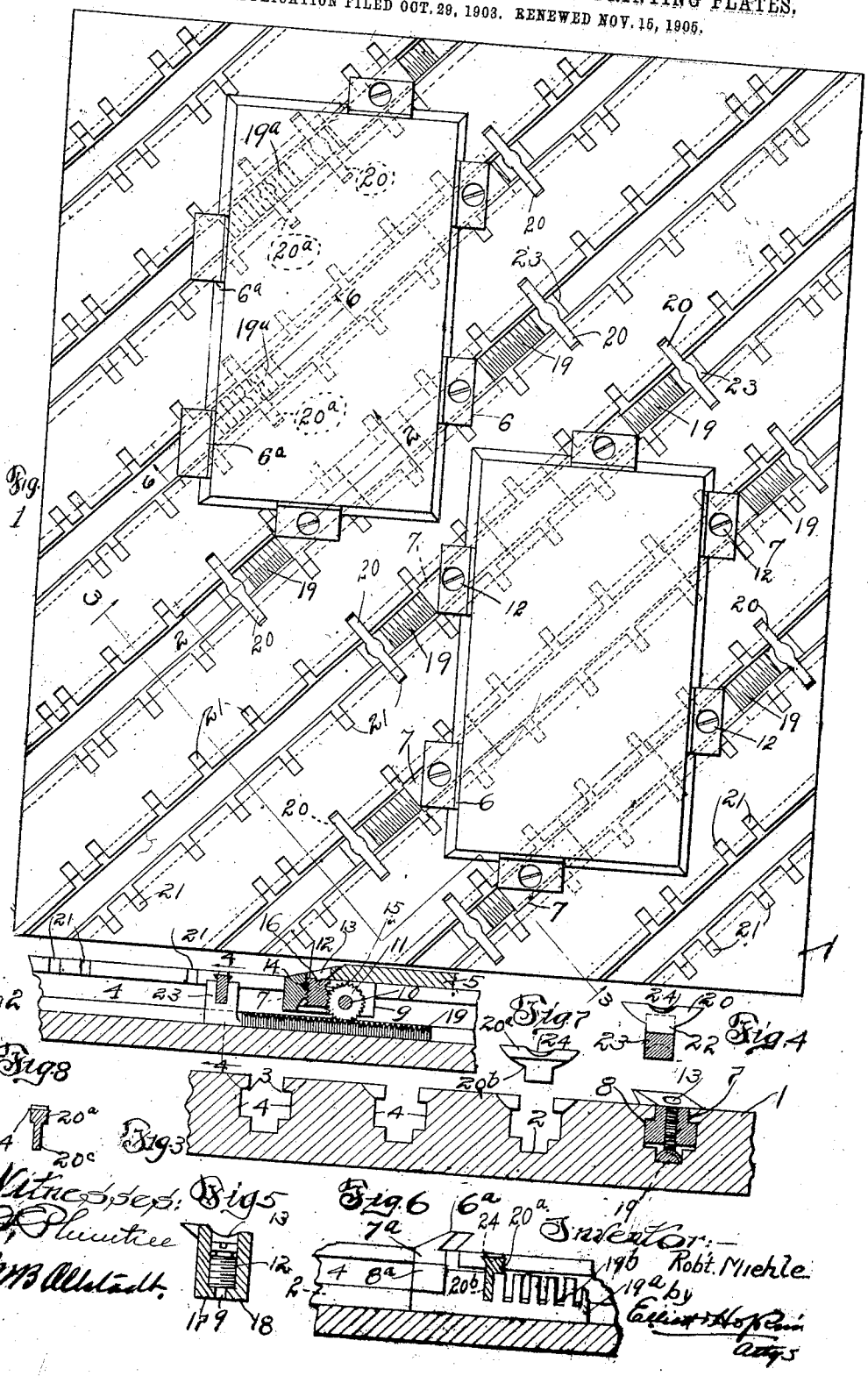
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R. MIEHLE.

MEANS FOR HOLDING AND REGISTERING PRINTING PLATES.

APPLICATION FILED OCT. 29, 1903. RENEWED NOV. 15, 1905.



UNITED STATES PATENT OFFICE.

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MEANS FOR HOLDING AND REGISTERING PRINTING-PLATES.

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Application filed October 29, 1903. Renewed November 15, 1905. Serial No. 287,481.

To all whom it may concern:

Be it known that I, ROBERT MIEHLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Means for Holding and Registering Printing-Plates, of which the following is a full, clear, and exact specification.

This invention relates to devices for clamping stereotype, electrotype, and other printing plates in such manner that the plates may be adjusted or registered on the base with great nicety, and it has more especial reference to that class in which the base is provided with a plurality of grooves or channels in its sufrace for retaining the plate-adjusting hooks or clamps. These grooves or channels are necessarily narrow and are only deep enough to accommodate the mechanism of the plate-adjusting devices, and for obvious reasons the entire clamp, with the exception of the hook proper, which engages the edge of the plate, must be of a size lying wholly within the groove, flush with or below the surface of the base, and consequently must be comparatively small, while at the same time is required to be of great strength. This invention has for its primary object to provide a plate holding and registering means possessing all or a substantial part of these qualifications and one in which the hook or clamp will be capable of rapid movement along the grooves to produce the approximate adjustment quickly, and slow and powerful movement throughout a long range toward and against the plate to effect the nice adjustment for registering the plate in printing colors or otherwise and the requisite clamping action against the plate.

A further object of the invention is to provide an improved and simple means for holding and registering printing-plates in which the plate-holding hook shall have rigid connection with the base and at the same time be capable of being readily detached therefrom and adjusted relatively thereto.

A still further object of the invention is to provide the clamp with traction means and the groove in the base at any desired point throughout its length with means for the engagement of said traction means, but which should be separate therefrom, so that the clamp may be moved at will independently of said latter means.

With these ends in view the invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects, hereinafter appearing, are attained, all as fully described with reference to the accompanying drawings and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a plan view of a grooved base, showing two printing-plates secured thereto by the aid of this invention. Fig. 2 is a vertical sectional view taken longitudinally of one of the grooves on the line 2 2, Fig. 1. Fig. 3 is a transverse section taken on the irregular line 3 3, Fig. 1. Fig. 4 is a vertical detail section taken on the line 4 4, Fig. 2. Fig. 5 is a detail cross-section of the clamp. Fig. 6 is a vertical section on line 6 6, Fig. 1. Fig. 7 is a detail side view of one of the keys for holding the rack shown in Fig. 6, and Fig. 8 is a detail of a key.

1 is the base, which is provided in its face with a plurality of grooves or channels 2, as usual. These grooves are formed diagonally, as shown in Fig. 1, to avoid the necessity of forming other grooves at right angles thereto, as well understood, and each is provided, preferably, along both sides with salient edges or inwardly-projecting flanges 3, which are formed by longitudinally grooving or recessing the opposite walls, as shown at 4, thus leaving the groove narrow at the bottom and top with an intermediate wider portion. In all of these grooves may be fitted one of the clamps or hooks by which the printing-plate shown at 5 is held and adjusted.

The hook 6 is formed on or otherwise rigidly secured to a body portion 7 of the clamp proper, which is provided with shoulders 8, one on each side, fitting in the grooves or recesses 4 in the side walls of the groove 2 and engaging under the flanges 3, formed by said recesses, the clamp being inserted endwise at either extremity of the groove 2 and is adapted to be slid longitudinally of such groove to any point in the length thereof where it can be most advantageously used for adjusting and clamping the printing-plate, the flanges 3 serving to hold the clamp down firmly within the groove 2, while the hook portion 6 of the clamp preferably bridges the groove 2 and rests against the surface of the base 1. The body portion 7

of the clamp is bifurcated at one end, as shown at 9, and in this bifurcation is journaled on a suitable bearing-pin 10 a toothed wheel 11, which is preferably in the form of a worm-wheel and with which engages an upright worm or screw 12, also journaled in the body portion 7 of the clamp in a suitable socket 13 and held against withdrawal therefrom by any appropriate means, such as a key or pin 14, passing through the body of the clamp and engaging in a peripheral groove 15 near the upper end of the screw, the upper end of the screw having a screw-driver slot 16 or other suitable means to facilitate the turning thereof for the purpose of rotating the gear-wheel 11. The threads of the worm or screw 12 are preferably right-hand, so that the rotation of the screw to the right will cause the wheel 11 to rotate toward the direction in which the hook 6 faces, so that this direction of rotation of the gear 11 will cause the longitudinal strain or pressure on the screw 12 to take place in a downward direction and not upwardly against the pin or key 14, which might be too frail to withstand it. This downward pressure, however, is easily resisted by stepping the screw upon two flanges or shoulders 17 18, left at the bottom of the socket 13 on either side of the bifurcation 9. These flanges 17 18 might be in the form of an integral bottom to the socket 13, the slot 9 between them being merely incidental to the sweep of the milling-tool, which produces the bifurcation for the accommodation of the wheel 11.

The wheel 11 projects slightly below the bottom of the clamp-body 7 and engages with the upper side of a rack-bar 19, which is placed in the bottom of the groove 2 and is held central therein by the narrow portion of said groove, as shown more clearly in Fig. 3, and it is held against longitudinal movement in the groove in any suitable way, but preferably by a means which will not entail the weakening of the base 1 nor interfere with the printing-plates 5 being placed above it whenever desired. An efficient means for accomplishing this consists of a key 20, which is adapted to be dropped down into any one of a number of cross-cuts 21, formed at suitable intervals across the grooves or channels 2. These cross-cuts 21 may be best formed by means of a milling-machine, and consequently are semicircular, and the upper portions of the key 20 are preferably made to conform thereto, as shown in Fig. 4, with a narrow portion 22 at the lower end of each, adapted to be engaged in a slotted head or lug 23, formed on or secured to one end of the rack 19, the portion 22 being extended downwardly in this manner for the sake of bringing the strain on the head 23 sufficiently near the rack 19 to avoid bending the head at its point of conjunction with the rack. The keys 20 may be formed with side portions 24, produced by upsetting the metal to facilitate their insertion and removal. One of these racks 19 is preferably employed for each of the clamps to be used, so that the clamp, together with its rack, may be quickly slid along the groove when the key 20 is removed to effect the approximate adjustment of the clamp or, in other words, to bring the clamp against or in close relation to the edge of the printing-plate, the key 20 being then dropped into that one of the cross-cuts 21 which is most accessible to the slotted lug 23, and the balance of the movement or adjustment of the clamp being then produced by rotating the screw 12, and thereby causing the clamp to travel in the proper direction along the rack 19, which forms a very effective means for the engagement of the worm-wheel 11, which constitutes at once a traction means and a self-locking means for holding the clamp against retrograde movement excepting when the screw or worm 12 is rotated, it being obvious that so long as the wheel 11 is in engagement with both the screw and the rack it will be effectually locked against rotation and will hold the clamp up to its work against the edge of the printing-plate; but when the key 20 is removed the entire clamp and its rack may be slid rapidly along the groove in the base to any desired point. In thus sliding the rack, together with the clamp, the clamp or hook portion 6 thereon may not always come into operative adjustment with the edge of the plate when the slotted head 23 is in register with the nearest one of the cross-cuts 21, but the rack 19 is made sufficiently longer than the clamp to provide for the balance of the adjustment by the aid of the screw 12. It is also quite obvious that the keys 20 and the slotted heads 23, as well as all of that portion of the clamp excepting the hook 6, being below or flush with the surface of the base, they may be projected in either direction indiscriminately under either one of the plates, the clamp and the rack of one of the devices being shown under one of the plates in Fig. 1.

The rack 19 is made half-round or semicylindrical. This shape, however, besides being incidental to the method of making it—namely, producing a complete screw and then cutting it in two longitudinally or by securing two rods together and then threading them—is desirable, in that the threads or teeth, being formed on an incline or spiral like those of a screw, better match with the teeth of the worm-wheel 11.

In some instances it is not necessary or desirable that the registering hooks 6 be employed on all sides of the printing-plate—as, for example, the position of one or more edges or sides of the printing-plate may be readily determined and then secured by some suitable rigid holding devices capable of sustaining the plate while the registering hooks

or clamps on the remaining sides or edges of the plate are adjusted or forced into position thereagainst. I have shown the left-hand side of the left-hand plate in Fig. 1 held by a means of this character, which is illustrated more in detail in Figs. 6 and 7 of the drawings and which is adapted to be rigidly secured to the base and readily detached therefrom with capability of a considerable range of adjustment with relation to the plate. This device, two of which are shown as applied to the left-hand edge of the left-hand plate in Fig. 1, consists of a hook proper, 6^a, which may be like the hook 6 in form and adapted to engage the beveled edge of the plate in substantially the same way, and this hook 6^a is formed on or secured to a sliding body portion or shank 7^a, which is formed with shoulders 8^a on both sides like the shoulders 8 engaging in the side grooves or recesses 4 of any one of the grooves 2, so as to be capable of sliding freely along the grooves to engage or disengage the plate, while held rigidly against upward movement by the conjoint action of the flanges 3 and the shoulders 8^a, and to this body portion or shank 7^a is secured or formed a rack-bar 19^a, which lies flat in the bottom of the groove 2, like the rack-bar 19, but which preferably differs from the latter in that it is flat on top and has its teeth 19^b extending thereacross at right angles to the groove 2 instead of inclined or spiral teeth like the rack 19, so as to be capable of engaging with and being rigidly held by a key comprising a body portion 20^a and an engaging member or flange 20^b, formed longitudinally of the edge of such body portion, which is adapted to be dropped into any one of the cross-cuts or key-seats 21, below or flush with the surface of the base, in the manner shown in Fig. 6, for holding the rack 19^a and its hook 6^a against longitudinal movement.

As illustrated in Fig. 6, the flange 20^b, although equal in width to the space between the teeth 19^b, is formed at one side of the body portion 20^a of the key or to one side of the center of key-seat 21, so that by taking the key out and turning it end for end and then replacing it in the same one of the key-seats 21 from which it was taken the hook 6^a with its rack 19^a may be moved or adjusted a distance equal to the difference between the thickness of the flange 20^b and the body portion 20^a, whereas to adjust the rack 19^a by sliding it under the key until the key engaged in the next space in the rack would necessitate an adjustment equal to the width of the tooth and the space between the teeth, which might be too much for the purpose. In order that the adjustment may be made still finer, additional keys may be provided with their engaging flanges or members differently situated. An example of one of such is shown in Fig. 8, in which the flange 20^c is located in the center of the edge of the key, and consequently should the first key be removed and replaced with this one the adjustment would be equal to only half the difference between the thickness of the body 20^a and the flange 20^b, or half the adjustment which is effected by turning the key end for end, as first described.

The hooks 6 being adjustable over a considerable range of movement without necessarily moving the racks 19, it will be seen that the securing means for the rack—that is to say, the key and slotted head or lug—may be locked entirely under the plate against which the hook impinges or under the adjacent plate, which could not be done if the construction was such that the hooks 6 could not be backed off from the plate a sufficient distance to permit the plate to be lifted off the base.

It is quite obvious that while this invention has been shown in connection with an integral base it might nevertheless be employed in connection with the sections of sectional bases, such sections having grooves or recesses for receiving the rack-bars and body portions of the hooks, as will be understood by those familiar with the art. It is also obvious that, if desired, the grooves in the base may be formed in both directions or at right angles to each other, or the base may have grooves formed in both directions across its face.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In a device for the purpose described, the combination of a grooved base, a clamp fitted to slide in the groove thereof, a rack locked in said groove and means for propelling said clamp by engagement with said rack, movable with the clamp.

2. In a device for the purpose described, the combination of a grooved base, a clamp fitted to slide in the groove thereof, a rack in said groove and means for propelling the clamp by engagement with said rack, movable with the clamp.

3. In a device for the purpose described, the combination of a base having a groove provided with a salient edge, a clamp slidable in said groove and shouldered under said edge, a rack arranged in the bottom of said groove and means projecting downwardly from said clamp for engaging the rack and propelling the clamp therealong.

4. In a device for the purpose described, the combination of a base having a groove in the face thereof, a portable rack arranged in said groove, means of detachably connecting the rack to the base, a clamp slidable in said groove and means, movable with the clamp for propelling the clamp along said rack by engagement with the rack.

5. In a device for the purpose described, the combination of a base having a groove in

the face thereof, a portable rack arranged in said groove, means arranged flush with or below the surface of said base for attaching the rack to the base, a clamp slidable in said groove and means engaging with the rack for propelling the clamp therealong, movable with the clamp.

6. In a device for the purpose described, the combination of a base having a groove in the face thereof, a portable rack arranged in said groove and having an attaching-lug at one end thereof, means in connection with said base for engaging and holding said lug, a clamp arranged in said groove, and means engaging said rack for propelling the clamp therealong, movable with the clamp.

7. In a device for the purpose described, the combination of a base having a groove in the face thereof, a portable rack arranged in said groove having a holding-lug, a removable key engaging in the base and also with said lug for holding said rack against longitudinal movement, a clamp arranged in said groove and means engaging said rack for propelling the clamp therealong, movable with the clamp.

8. In a device for the purpose described, the combination of a base having a groove in the surface thereof, a portable rack having a slotted lug arranged in said groove, a removable key having connection with the base and adapted to seat in the slot of said lug for holding the rack against longitudinal movement, a clamp arranged in said groove and means engaging with said rack for propelling the clamp therealong, movable with the clamp.

9. In a device for the purpose described, the combination of a base having a groove in the surface thereof, and one or more cross-cuts bisecting said groove, a portable rack arranged in said groove and having a holding-lug, a key adapted to be seated in any one of said cross-cuts and to engage with said lug for holding said rack against longitudinal movement, a clamp arranged in said groove and means engaging said rack for propelling said clamp therealong.

10. In a device for the purpose described, the combination of a grooved base having cross-cuts bisecting said groove, a portable rack arranged in said groove, a key seated in said cross-cut flush with the surface of said base, and engaging said rack for holding it against longitudinal movement, and having lifting means whereby it may be raised out of said cross-cut, a clamp arranged in said groove and means engaging said rack for propelling said clamp therealong.

11. In a device for the purpose described, the combination of a grooved base, a clamp slidable in said groove, a rack fixed in the groove between one side thereof and the clamp, a self-locking propelling means arranged on the clamp and engaging said rack for propelling the clamp along the rack.

12. In a device for the purpose described, the combination of a grooved base, a clamp slidable in said groove, a rack fixed in the groove between one side thereof and the clamp, and a worm-wheel-propelling means arranged on the clamp and engaging the rack for propelling the clamp along the rack.

13. In a device for the purpose described, the combination of a grooved base, a rack fixed in said groove, a clamp slidable in said groove, a worm-wheel journaled in said clamp and engaging said rack and a screw or worm journaled in said clamp and engaging said wheel.

14. In a device for the purpose described, the combination of a grooved base, a semi-cylindrical screw constituting a rack arranged in the said groove, a clamp slidable in the groove over said rack, and a second screw journaled on said clamp and having operative connection with said first screw for propelling the clamp therealong.

15. In a device for the purpose described, the combination of a grooved base, a semi-cylindrical screw fixed in the groove thereof, and constituting a rack, a clamp slidable in said groove, a worm-wheel journaled in said clamp and engaging said rack and a second screw or worm journaled in said clamp and engaging said worm-wheel.

16. In a device for the purpose described, the combination of a grooved base, a rack in the groove thereof, a clamp slidable in the groove thereof, and having a perpendicular socket projecting through the upper side thereof, a screw stepped in and resting upon the bottom of said socket, means for holding said screw against outward movement and means for imparting the movement of said screw to said rack for propelling the clamp along the rack.

17. In a device for the purpose described, the combination of a base having a series of sockets, a rack situated in said base below the surface thereof, removable means adapted to be inserted in any one of said sockets and engaging with said rack for holding the latter against longitudinal movement, and means in connection with said rack for engaging and holding the printing-plate.

18. In a device for the purpose described, the combination of a base having a seat for holding a key, a rack situated in said base below the surface thereof, a removable transposable key arranged in said seat and having an engaging member for engaging and holding said rack against longitudinal movement, said engaging member being narrower than said seat, and means in connection with said rack for engaging and holding the printing-plate.

19. In a device for the purpose described,

the combination of a base having a groove and a cross-cut leading from said groove, a rack adapted to slide in said groove, a key adapted to drop into said cross-cut and engage with said rack, and means in connection with the rack for engaging and holding the printing-plate.

20. In a device for the purpose described, the combination of a grooved base, a rack slidable longitudinally of said groove, a transposable key movably secured in the base and engaging said rack whereby one position of the key will hold the rack at different adjustments, and means in connection with the rack for engaging and holding the printing-plate.

21. In a device for the purpose described, the combination of a grooved base having a cross-cut extending from the groove thereof, a rack movable longitudinally in said groove, a key adapted to fit into said cross-cut and having a flange arranged to one side of the center of said cross-cut for engaging and holding said rack, and means in connection with the rack for engaging and holding the printing-plate.

22. In a device for the purpose described, the combination of a grooved base, a clamp comprising a body fitted to slide in the groove of said base, and a hook fixed to said body, means on said clamp for propelling said hook longitudinally of the groove in said base, and means adjustably secured in said groove for the engagement of said propelling means.

23. In a device for the purpose described, the combination of a grooved base, a clamp comprising a body fitted to slide in the groove of said base, and a hook fixed to said body, means on said clamp comprising a rotary member having a serrated engaging face for propelling said hook lengthwise of the groove in said base, and means adjustably secured in said groove having a horizontal series of serrations for the engagement of said first serrations.

24. In a device for the purpose described, the combination of a grooved base, a clamp comprising a body fitted to slide in the groove of said base, and a hook fixed to said body, means movable with said hook for propelling the hook longitudinally of the groove in said base, and means adjustable longitudinally of the said groove in the base for the engagement of said propelling means.

25. In a device for the purpose described, the combination of a grooved base, a clamp comprising a body portion slidable longitudinally in the groove of said base and a hook fixed to said body, means for propelling said clamp longitudinally of said groove, comprising an operating member accessible through said hook, and means in said groove for the engagement of said propelling means.

26. In a device for the purpose described, the combination of a base having a groove and a cross-cut leading from said groove, a rack adapted to slide in said groove, means adapted to be placed into said cross-cut and engaging with said rack, and holding said rack against movement in both directions, and means in connection with the rack for engaging and holding the printing-plate.

27. In a device for the purpose described, the combination of a grooved base, a clamp fitted to reciprocate in the groove of said base, a removable, portable rack in said groove, and means for propelling the clamp by engagement with said rack.

28. A registering device including a plate-supporting block, a register-hook structure movable upon the block, gearing accessible through the traveling-hook structure, an element of said gearing having a vertical axis of rotation and traveling with the hook.

29. A registering device including a plate-supporting block, a register-hook structure movable upon the block, gearing accessible through the traveling-hook structure, an element of said gearing having an axis of rotation transverse to the line of travel of the hook, which gear element travels with the hook.

30. A registering device including a plate-supporting block, a register-hook structure movable upon the block, gearing including two elements carried by the hook structure, one of said elements being a threaded shaft accessible through the hook structure, said gearing also including a coöperating gear element carried by the block.

31. In a device for the purpose described, the combination of a grooved base, a clamp fitted to slide in the groove thereof, a rack in said groove, and means for propelling the clamp by engagement with said rack in both directions.

32. In a device for the purpose described, the combination of a grooved base, a clamp fitted to slide in the groove thereof, a rack in said groove, means for propelling the clamp by engagement with the rack, and means for holding the clamp against movement in both directions.

33. In a device for the purpose described, the combination of a grooved base, a clamp movable along said groove, a gear carried by the clamp, and means on the base having coöperative relation to the said gear, whereby the operation of the gear propels the clamp along the groove.

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Witnesses:
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