

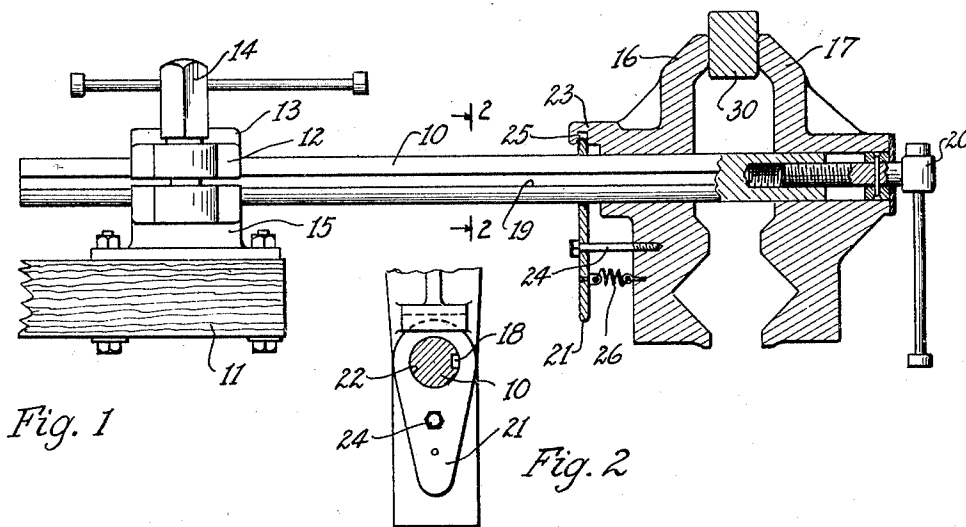
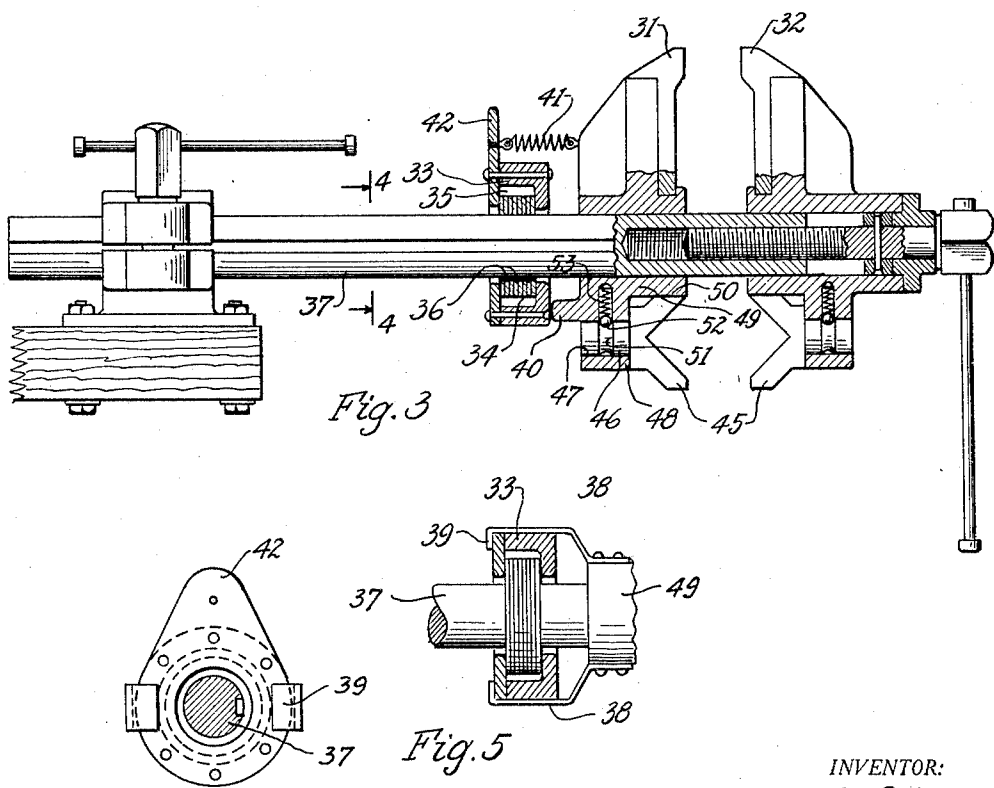
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CLAMPING DEVICE

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CLAMPING DEVICE

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This invention relates to clamping devices, and it has for its object providing a clamping device which may be quickly and conveniently opened and closed, and a special object is to provide means for opening the clamp a very material distance without the necessity of operating screws or other similar devices.

This application is a continuation in part of my co-pending patent application Serial No. 133,881, filed September 7, 1926.

Of the accompanying drawings Fig. 1 is an elevation, partly in section, of a clamping device in the nature of a vise which embodies the features of my invention; Fig. 2 is a sectional view of the same along the line 2—2 of Fig. 1; Fig. 3 is an elevation of a modified form of the clamping device; Fig. 4 is a sectional view along the line 4—4 of Fig. 3; and Fig. 5 is a fractional view of Fig. 3 with the parts shown rotated through 90°.

In general my invention comprises a rod or bar 10 which may be used either to support the clamping device or it may be supported by the clamping device. In this instance I show the rod supported on a bench 11 by means of any suitable supporting means such as the clamp 12. This clamp comprises an ordinary split collar 13, the lips of which may be pressed together by means of the screw 14, the collar being supported on the bench by means of a bracket 15. My clamping device in this instance is supported at the outer end of the rod or bar 10 and comprises jaws 16 and 17 which are both slidably mounted upon the shaft 10 but which are kept from rotation thereon by means of keys 18 fixed to the respective jaws and playing in the keyway 19 of the shaft. The jaw 17 may be moved with reference to the rod 10 by rotating the screw 20, thus forcing the jaw towards or away from the jaw 16. This screw 20, co-operating as seen with the jaw 17 and the bar or rod 10 constitutes means for giving said jaw 17 a limited movement on the bar or rod 10 and holding it where it is moved. The jaw 16 may be slid along the rod 10 towards the jaw 17 without hindrance. But an element 21, which for convenience I call a trigger, normally prevents movement of the jaw 16 away from the jaw 17. The trigger or cramping member 21 has an opening 22 through which the rod or bar 10 passes, and, as the opening is but slightly larger than the rod 10, any tilting of the trigger or cramping member on the rod or bar will bind it thereon and prevent relative movement of the two elements. As a consequence, when the pressure is brought to bear on the jaw 16, this jaw, by means of the lug 23, pushes the upper end of the trigger or cramping member so as to bind it on the rod or bar 10 and prevent rearward movement of the jaw. The upper end of the trigger plays freely in a slot 25 in the lug 23 and hence may be tilted with reference to the jaw 16 but cannot be moved materially horizontally with reference to the jaw. A bolt 24 prevents rotary movement of the trigger around the rod or bar 10 and also prevents movement of the lower end away from the jaw 16, so as to bind the trigger or cramping member on the rod or bar when the jaw is moving towards the jaw 17. This bolt connected with the jaw and cramping member or trigger as shown constitutes connections between them permitting the cramping member to bind upon attempted relative movement of the bar and members in one direction while preventing its binding during the relative movements in the other direction. Its head also constitutes an abutment limiting the swinging movement of the cramping member in one direction.

It will thus be seen that the jaw 16 is free to move forwardly or towards the jaw 17 without any hindrance by the trigger or cramping member, but any effort to move the jaw 16 rearwardly will be overcome by the tilting tendency of the trigger 21 and the binding

thereof on the rod or bar 10; and the greater the force against the jaw 16 the greater the binding tendency. In order to insure the binding of the trigger or cramping member on the rod or bar the operator may pull the lower end of the trigger 21 forward slightly; or a spring 26 may be used to hold the lower end of the trigger normally in its binding position. When the spring is used the operator, to move the jaw 16 rearwardly, may press the trigger out against the head of the bolt 24 and when in its proper position, if the trigger is released, the jaw will instantly be held from further rearward movement.

In clamping between the jaws such objects as the bar 30 the jaw 16 is brought snugly up against the bar when it is in contact with the jaw 17 and the screw 20 is rotated to force the jaw 17 towards the bar. The trigger 21 will prevent movement of the jaw 16 rearwardly and the screw will force the two jaws together as firmly as may be desired.

In case of the device of Fig. 3 the jaws 31 and 32 are arranged to clamp such articles as may be desired in somewhat the same way as the jaws 16 and 17. In this instance, however, I substitute for the trigger 21 a casing 33 enclosing a plurality of disks 34 which likewise form a cramping member, as hereinafter explained. The chamber 35 of the casing is deep enough to allow free relative movement of the disks, at the same time holding them fairly snugly together. And the openings 36 in the disks are somewhat larger than the rod 37 upon which the jaws and the disks are mounted. So that when the casing 33 is tilted slightly with reference to the bar the disks will bind on the bar, as in case of the trigger 21. The casing is limited in its movement away from the jaw 31 in any suitable manner, such as by means of fingers 38 fixed to the jaw and having flanges 39 extending over the casing 33. The movement of one side of the casing towards the jaw is limited by a boss 40, or in any other suitable manner. At the same time the casing is free to tilt more or less on the bar and with reference to the jaw. A spring 41 at all times tends to pull the side of the casing opposite the boss towards the jaw, the spring being fixed to the jaw and to the arm 42 which is fixed to the casing.

It will thus be seen that, when the jaw 31 is pulled towards the jaw 32 it will move freely, as the casing 33 will not be tilted. But the disks in the casing will prevent movement of the jaw 31 away from the jaw 32 unless the casing is held from tilting by pushing the arm 42 away from the jaw. When the casing is tilted by the spring, as each disk will be tilted and will bind on the bar, there will be less tendency for the jaws to be forced apart than would be the case with a single disk or with the single trigger or cramping member 21. While, ordinarily, the single

trigger or disk would be ample, yet it sometimes happens in the use of the device that there is a pounding or jarring effect that may cause the jaws to open slightly if backed by only a single disk or trigger. But with a number of disks, as indicated in Fig. 3, this tendency will be substantially eliminated.

In this modified vise I show detachable jaws 45 so that they may be removed and jaws of other shapes inserted when desired. To facilitate removal the jaws have shanks 46 which enter openings 47 in the projection 48 of the hub 49 of the jaw. The flattened surfaces at 50 prevent rotation of these jaws when in place. And to prevent the jaws falling out inadvertently I form a groove 51 in the shank and a pin or a ball 52 is adapted to be forced, by a spring 53, into this groove when the jaw is in place.

I claim as my invention:—

1. In a device of the class described, the combination with a bar, of a jaw adapted per se to move freely relatively thereto, a tilting cramping member carried by the jaw and through which the bar extends and adapted automatically to be cramped on the bar to prevent relative movement of the jaw in one direction while permitting it in the other, means carried by the jaw and co-operating with the cramping member to limit its tilting movement when the jaw is moved in the permissible direction, a second jaw having a limited movement on the bar toward and from the first jaw, and means for giving said second jaw said limited movement and holding it where it is moved.

2. In a device of the class described, the combination with a bar, of a jaw adapted per se to move freely relatively thereto, a tilting cramping member carried by the jaw and adapted automatically to be cramped on the bar to prevent relative movement of the jaw in one direction while permitting it in the other, means carried by the jaw and co-operative with the cramping member to limit its tilting movement when the jaw is moved in the permissible direction, a second jaw having a limited movement on the bar toward and from the first jaw, and means for giving said second jaw said limited movement and holding it where it is moved, said means consisting of a screw mounted to turn in said second jaw and threaded into the bar.

3. A clamping device comprising a rod, a first and second jaw slidably mounted on said rod, means for forcibly moving said first jaw toward the other, and means for preventing the movement of the second jaw away from said first jaw, said latter means comprising a plate having an opening therethrough, said rod passing through said opening normally at right angles thereto, said plate being pivoted at one end to its associated jaw, the other end of the plate being free to move toward the associated jaw to an oblique angle with said

rod, and means preventing movement of said other end away from said associated jaw beyond the normal position at right angles to said rod.

5 4. A clamping device as claimed in claim 3, and means for preventing rotation of either of said jaws on said rod.

5 5. A clamping device as claimed in claim 3, and resilient means tending to force said other end toward said associated jaw.

10 In testimony whereof, I hereunto set my hand.

EUGENE A. ODIN.

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