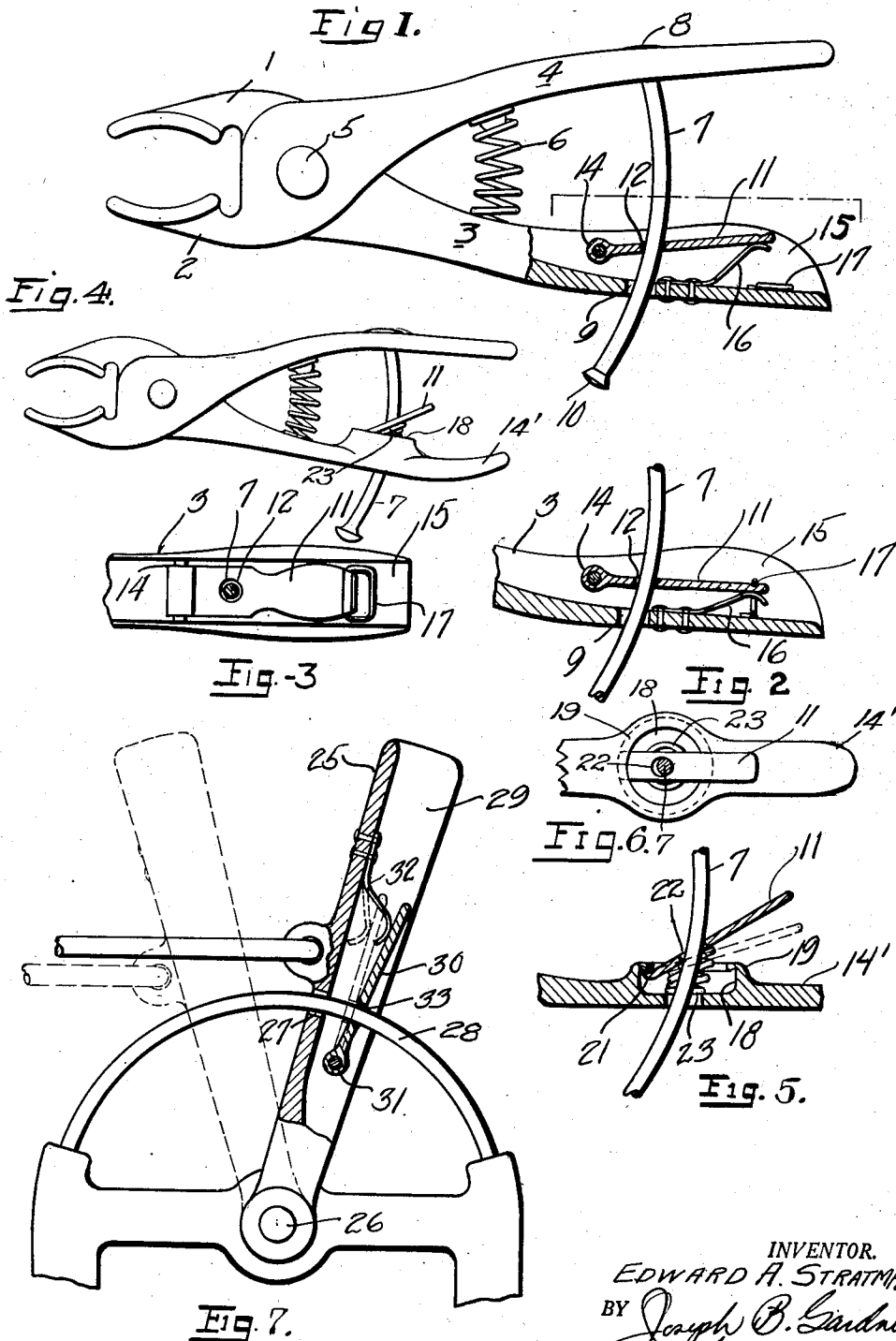


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LEVER LOCKING DEVICE
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LEVER LOCKING DEVICE

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4 Claims. (Cl. 31-49)

This invention relates to a novel and highly efficacious device for locking levers, handles and the like against movement out of predetermined positions, and although the present embodiment is particularly adapted for use with pliers, pinchers, clamps and like tools having opposed levers or handles, it is also subject to advantageous use with other levers, handles, et cetera, of various kinds.

An object of the invention is to provide a device of the character described which is of simple and inexpensive construction and adapted for installation between the handles or levers of pliers, or the like, in such manner that the jaws of the pliers will be automatically locked in the position to which they are moved and may be quickly and easily released by a slight displacement of a locking element, which may be brought about with a mere touching of said element.

A further object is to provide pliers of the character described in which the locking means therefor, as aforementioned, is disposed in a convenient position on the handles in such manner that it will not interfere with the operation of the pliers nor be likely to become accidentally released when the pliers are locked.

Among the advantageous features of the locking means of this invention are simplicity and compactness of construction, automatic locking incident to movement of the parts to be locked into a desired position, quick and easy release which in the case of pliers having a spring to urge the jaw apart, causes an automatic spreading or release of the jaws following a slight manual displacement of the locking means, the adaptability of the device to levers, handles, et cetera, of various kinds, and the saving in time and effort and increased efficiency provided by the use of the device in pliers, clamps and the like.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawing accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawing and description may be adopted within the scope of the invention as set forth in the claims.

Figure 1 represents a top plan view partially in section of a pair of pliers constructed in accordance with my invention.

Figure 2 is a fragmentary longitudinal sec-

tional view showing the locking means on one of the handles of the pliers.

Figure 3 is a top plan view of the showing made in Figure 2.

Figure 4 is a top plan view of a modified form of the invention.

Figure 5 is a fragmentary longitudinal sectional view showing the locking means on the form of the invention disclosed in Figure 4.

Figure 6 is a fragmentary top plan view of the locking means of Figure 5.

Figure 7 is a side elevation of another modified form of the invention.

One embodiment of my invention as shown in detail in the accompanying drawing comprises a pair of pliers having opposed jaws 1 and 2 carried on terminals of handles or levers 3 and 4 which are crossed and then pivotally joined by the usual pivot means 5. As here shown, a spring 6 is arranged between the handles to normally urge them and the jaws apart, it being noted that to grip an object with the jaws the handles are drawn together as is customary in tools of this character.

To provide for locking the jaws in an operative position, I employ the locking means of this invention arranged between and on the handles 3 and 4. This locking means essentially comprises two cooperating elements, one for each handle. As here shown one of the elements comprises a curved rod 7 fixed at one end at 8 to the handle 4 and extended freely through an opening 9 in the handle 3, the curve of said rod being substantially concentric with the pivot. Thus, it will be seen that on manipulation of the handles the rod will move through the opening 9 and project from the handle 3, there being a head 10 on the free end to prevent withdrawal of the rod. The rod is circular in cross section and of small diameter whereby it may extend between the fingers of the operator's hand without interfering with the normal operation of the pliers.

The other locking element 11 mounted on the handle 3 is in the form of an arm or plate pivoted to the handle as at 14 and having an opening 12 therein through which the rod is freely slidable. This member or locking plate 11 is so arranged that on movement of the handle to bring the jaws into an operative position the rod slides through the plate but is prevented from return movement by the angular friction grip of the plate on said curved rod at the opening 12. Thus the rod is locked in any position to which it is moved in adjusting the jaws and therefore the

handles and jaws are automatically locked in position. Release of the handles and jaws is effected by a slight displacement of the plate 11, a light inward pressure of the finger being sufficient to release the grip on the rod about the edges of opening 12.

As here shown the plate 11 is pivoted within the channel 15 of the handle 3 and is normally urged outward by a leaf spring 16. Preferably the plate 11 lies within the channel at all times whereby the possibility of accidental engagement and release thereof is minimized and the normal gripping of the handles is not interfered with.

It will now be seen that the spring 16 urging the plate 11 outward, serves to maintain the plate in such relation to the curved rod 7 that movement of the latter will be permitted in one direction but will be prevented in the opposite direction owing to the friction grip of the plate with said rod about said opening. Release of the plate requires but a slight depression thereof against action of the spring whereby to eliminate the grip at the opening 12. It is now clear that the locking operation is entirely automatic and that on release of the lock, the spring 6 will quickly move the jaws and handles apart. The spring 16 maintains the plate ready for the automatic locking operation at all times.

Means is provided to easily render the locking means inoperative and as here shown comprise a ring 17 arranged on the handle 3 to be swung into and out of a position holding the plate 11 in inoperative position. To set this means, the plate 11 is depressed and the ring is then moved to hook over and hold the plate in such position. When the locking means is inoperative, the pliers may be operated in the ordinary manner and must be held in gripping position.

As shown in Figure 5, the plate 11 instead of being pivoted on a fixed axis may be arranged to be rotated or turned on its axis. In this arrangement the handle 14' is formed with a circular depression 18 having an annular flange 19 at its upper side. The plate 11 in this form has one end extended into said depression and a flange 21 on said end hooks under the flange 19 in slidable relation thereto. An opening 22 in the plate accommodates the rod 7 as in the previously described form and in addition provides for the rotation of the plate about said rod. A spring 23 surrounds the rod and is disposed in the depression 18 beneath the plate 11 to normally urge the latter into position to grip and lock the rod 7 in the same manner as in the other form of my invention. It will now be seen that the locking plate of this form may be turned into various positions best suited to the operator and the occasion.

In Figure 7 I have shown an application of the locking means of my invention to a single lever

25 such as used in controlling machinery. This lever is pivoted as at 26 to a suitable support and has an opening 27 arranged to slidably accommodate a fixed quadrant rod 28 of circular cross section and which corresponds to the rod 7, it being concentric with the pivot 26. The lever is channeled as at 29 and in the channel a locking plate 30 is pivoted as at 31. This plate is urged outward by a spring 32 and has an opening 33 therein through which the quadrant rod 28 is slidable in the same manner as is the bar 7 in the other form of my invention. This plate locks the lever automatically and is released by a slight depression thereon, in the same manner as the plate 11 in the other form of my invention.

I claim:

1. In a locking device, relatively movable opposed members, a curved rod fixed to one of said members and intersecting the other of said members, a locking plate on the last named member having an opening therein through which the rod is slidable, and a spring on the last named member urging said plate to a position such that the plate will frictionally grip and prevent unintentional movement of the rod in one direction, and means for rendering said plate inoperative to lock said rod.

2. In a locking device, relatively movable opposed members, a curved rod fixed to one of said members and intersecting the other of said members, a locking plate on the last named member having an opening therein through which the rod is slidable, and a spring on the last named member urging said plate to a position such that the plate will frictionally grip and prevent unintentional movement of the rod in one direction, and means for rendering said plate inoperative to lock said rod, said means comprising a wire loop mounted on said other member and movable to engage and hold said plate in position disposing said opening in alignment with said rod.

3. In a locking device, relatively movable opposed members, a rod on one of said members, a locking plate on the other of said members having an opening therein through which the rod is slidable, said locking plate being movable to frictionally grip said rod, and means for rendering said plate inoperative to grip said rod.

4. In a locking device, relatively movable opposed members, a rod on one of said members, a locking plate on the other of said members having an opening therein through which the rod is slidable, said locking plate being movable to frictionally grip said rod, and means for rendering said plate inoperative to grip said rod, said means comprising a tie member movable to engage and hold said plate with said opening in alignment with said rod.

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