Dec. 5, 1950 B. BURNS 2,532,659

SNAP-LOCK WRENCH

Filed June 1, 1948

Fig. 1.

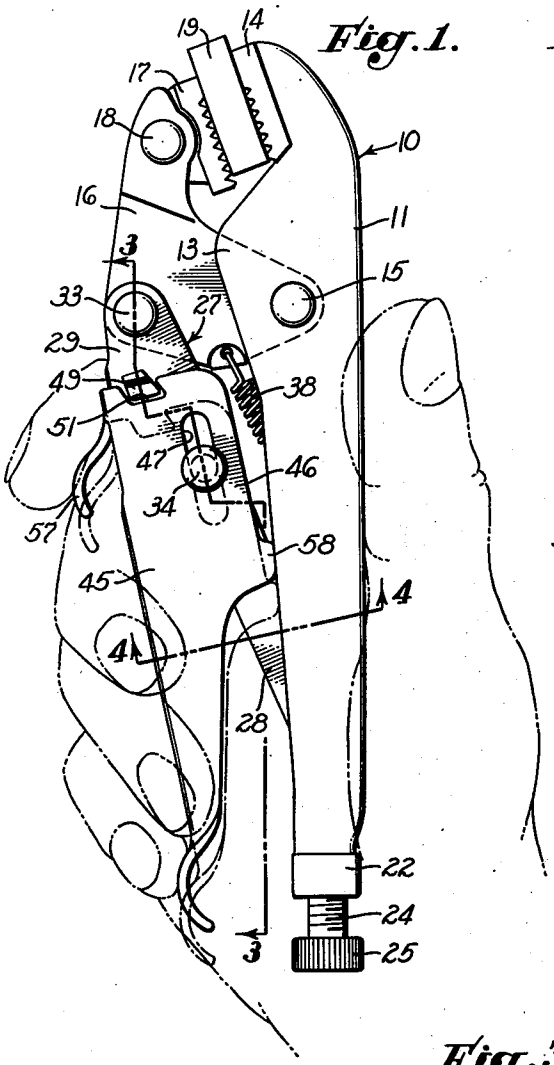


Fig. 2.

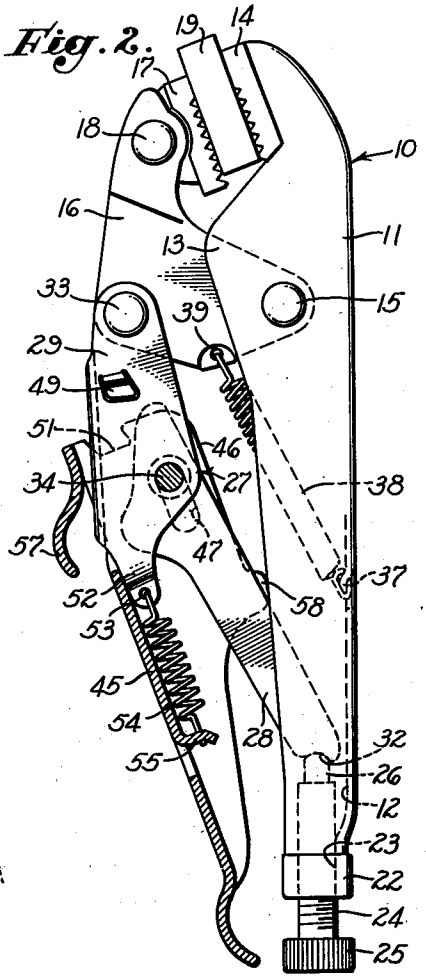


Fig. 3.

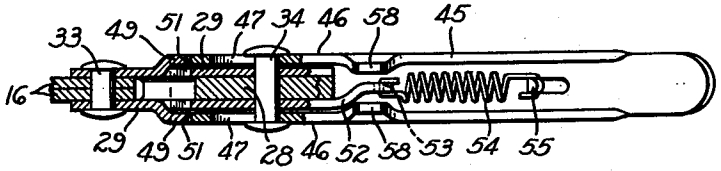
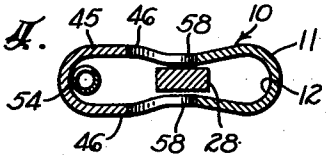


Fig. 4.



INVENTOR.
BRUCE BURNS
BY HIS ATTORNEYS.
HARRIS, KIECH, FOSTER & HARRIS
BY Fred W Harris

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SNAP-LOCK WRENCH

Bruce Burns, Yucca Valley, Calif.

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8 Claims. (Cl. 81—84)

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The invention relates to improvements in a wrench of the type commonly known as a toggle wrench or vise-wrench wherein one of a pair of jaws is adjusted into contact with an object positioned between said jaw and the other jaw and the one jaw locked in a closed position to securely and firmly grip the object until the one jaw is released.

Such wrenches of this type as have been constructed in the past possess inherent structural characteristics which have rendered them difficult to use in confined quarters. It is very easy with wrenches of this type to overadjust the movable jaw of the wrench so that when the jaw is once locked against said object it becomes very difficult to release it therefrom and it frequently requires as much expenditure of energy to release the movable jaw of such a wrench from the object as was necessary to originally clamp it thereupon. The closing and clamping operation is performed by gripping a pair of handles and forcing them toward one another in much the same manner as the handles of a pair of ordinary pliers are manipulated. In such a situation the hand works in a position of maximum advantage and can apply great closing force with little conscious physical strain. The user of the wrench can thus close and lock an overadjusted tool inadvertently or without being very aware of the degree of overadjustment. In the opening or releasing operation, however, when it is necessary to force the handles apart, one hand works in an unnatural position and at a disadvantage. It will be observed frequently that a wrench may be closed and locked on the work with one hand and without apparent expenditure of undue force, but when a similar force is required for release, both hands must be used.

Since prior art wrenches of this type have depended upon an outward movement of the handle associated with the movable jaw to release said jaw when wrenches thus constructed are utilized in confined quarters, the great application of force necessitated to release the movable jaw from an object clamped thereby frequently results in the user of the wrench sustaining minor injuries because of sudden contact with surrounding areas upon the sudden release of the jaw from the object.

Since the release of the movable jaw in prior art wrenches necessitates the outward movement of one of the handles of the wrench in relationship to the other, the user of the wrench is often compelled to use both hands when releasing the wrench from an object clamped thereby. Thus, since both hands of the user of the wrench are engaged in releasing the wrench from the object, it is necessary to permit the object to fall from between the jaws of the wrench when released.

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A wrench of the vise-wrench type embodying the improvements which constitute the subject matter of my present invention eliminates to a great degree the above outlined difficulties encountered in prior art wrenches. A vise-wrench constructed in accordance with my invention may be opened with one hand and a far greater amount of leverage is available in opening the wrench than is available in closing it. Therefore, the difficulty encountered in prior art wrenches with overadjustments of the movable jaw is obviated.

A vise-wrench constructed in accordance with my present invention may be opened with one hand because the release of the movable jaw is achieved by moving one handle of the wrench inwardly in relationship to the other handle, instead of outwardly as was previously the case. Naturally, such inward movement of the handles of the wrench in relationship to each other greatly facilitates the release of the wrench from an object in confined quarters since it is no longer necessary to insert both hands into a confined space and attempt to move the handles of the wrench outwardly in relation to each other to effect the release of the wrench from an object.

Of course, since the wrench may be readily released with one hand, the user of the wrench may support the object clamped by the wrench with his other hand and the release of the jaws of the wrench from the object need no longer occasion the dropping of the object to the workbench or ground.

Therefore, a primary object of my invention is the provision of a vise-wrench which may be readily released from an object clamped in said wrench with one hand.

It is another object of my invention to provide a vise-wrench which may be opened by moving one handle of the wrench inwardly in relationship to the other handle.

Another object of my invention is the provision of a vise-wrench which may be more readily utilized in confined quarters than has been possible hitherto with prior art vise-wrenches.

A further object of my invention is the provision of a vise-wrench which is so constructed that the mechanical advantage utilized in releasing the wrench from an object clamped

therein is much greater than the mechanical advantage provided in the initial clamping of the wrench upon the object.

A further object of my invention is the provision of improvements for wrenches of the vise-wrench type which can be manufactured and sold in the form of a kit and which can be readily installed upon prior art wrenches already in use, thus eliminating the necessity of discarding prior art wrenches in order to achieve the advantages of the construction which is the subject matter of my invention.

Another object of my invention is the provision of a vise-wrench which may be readily and easily constructed and which may be sold at a moderate price.

Other objects and advantages of my invention will be apparent from the following specification and the accompanying drawing, which is for the purpose of illustration, and in which:

Fig. 1 is a vertical elevational view showing the manner in which a vise-wrench constructed in accordance with my present invention is adapted to be held in the hand of a user thereof;

Fig. 2 is a vertical, partly elevational, partly sectional view of a wrench constructed in accordance with my invention showing the combined locking and releasing handle in the position which it assumes when the wrench is being released from an object upon which it is clamped;

Fig. 3 is a longitudinal, sectional view taken on broken line 3—3 of Fig. 1; and

Fig. 4 is a cross section taken on line 4—4 of Fig. 1 which shows the manner in which the cam embodied in the locking and releasing handle impinges on the relatively stationary handle of a wrench constructed in accordance with my present invention.

Referring now to the drawing, I show a vise-wrench 10 having a relatively stationary handle 11 which may be formed from sheet metal or similar material into a channel shape which is inverted to form a downwardly opening, elongated chamber 12. The word "stationary" is utilized in describing the handle 11 in order to convey the idea that the handle 11 is not moved to perform the vise-wrench clamping action. It is, of course, not desired to convey the idea that the handle 11 is so fixed that it cannot be readily moved and variously positioned by the user of the wrench. The handle 11 is provided with a pair of integral, downwardly projecting ears 13 in the forward portion thereof, and a nonmovable jaw member 14 having its rear end adjacent the forward edges of said ears is secured in the end of said handle 11 by welding or similar means. When the jaw 14 is described as being nonmovable it is intended to convey the idea that the clamping action of the wrench is not achieved by the movement of the nonmovable jaw 14 in relation to the other elements of the wrench 10.

Pivotally secured to the handle 11 through the medium of a first pivot pin 15 is a jaw mounting plate 16 which is of generally triangular or bell-crank shape and which is housed to a certain extent within the chamber 12 provided by the walls of the channel-shaped handle 11. A movable jaw 17 is secured to the upper end of the jaw mounting plate 16 through the medium of a rivet 18 or similar fastener and is adapted to be swung upon said jaw mounting plate 16 below the nonmovable jaw 14 in order that it may be adjusted into a position which will enable it to contact the surface of an object 19 positioned between it and the nonmovable jaw 14. When

the jaw 17 is described as being movable it is intended to convey not only the idea that the jaw 17 is movable with the wrench 10 as a whole, but also the notion that the jaw 17 is movable with the jaw mounting plate 16 and that the clamping action of the wrench 11 is obtained through the movement of the jaw 17 in relation to the nonmovable jaw 14.

The other end of the handle 11 of the wrench 10 is stamped or otherwise formed into circular shape and has clamped thereupon a circular collar 22 which serves to prevent the spreading of the handle 11 and its consequent distortion in this region. An internally threaded bore 23 is provided in the circular end of the handle 11 in which is threadedly engaged an adjusting bolt or screw 24 having an integral, knurled adjusting knob 25 formed thereupon. That end of the adjusting screw 24 which projects inwardly into the chamber 12 provided by the walls of the handle 11 is substantially reduced in diameter for a certain portion of its length to provide an adjusting pin 26.

A toggle linkage 27 which consists of a first toggle link 28 and a second toggle link 29 is provided in order that the movement of the adjusting screw 24 may be communicated to the jaw mounting plate 16 to accomplish the initial adjustment of the movable jaw 17 in relation to the nonmovable jaw 14. The first toggle link 28 has an end thereof projecting into the confines of the chamber 12 provided by the walls of the handle 11 and has a concavity 32 formed therein adapted to register with the adjusting pin 26 and to permit the adjusting pin 26 and the associated adjusting screw 24 to drive the end of the first toggle link 28 forward within the confines of the chamber 12 when the adjusting screw 24 is advanced in the bore 23. The other end of the first toggle link 28 extends in the direction of the jaw mounting plate 16. The second toggle link 29 is pivotally secured to the rear corner of the jaw mounting plate 16 through the medium of a second pivot pin 33 and has its other end pivotally secured to the adjacent end of the first toggle link 28 through the medium of a third pivot pin 34.

A downwardly projecting, integral tongue 37 is formed in the handle 11 and is adapted to secure one end of a coil spring 38 which has its other end mounted in a hole 39 provided in the rear end of the jaw mounting plate 16. The coil spring 38 thus connects the handle 11 with the jaw mounting plate 16 and continuously tends to hold the jaw mounting plate 16 and its associated movable jaw 17 out of engagement or contiguity to the nonmovable jaw 14.

The second toggle link 29 has a combined locking and releasing handle 45 mounted thereupon through the medium of the third pivot pin 34. The combined locking and releasing handle 45 may be formed of sheet material into a generally channel-shaped member having the sides 46 thereof enshrouding or covering the greater portion of the second toggle link 29. Each of the sides 46 of the combined locking and releasing handle 45 has formed therein an elongated, longitudinal slot 47 which engages the third pivot pin 34 and permits the combined locking and releasing handle 45 to be moved back and forth over the second toggle link 29. Projecting outwardly from the sides of the second toggle link 29 are detent means which, in the present embodiment of the invention, are constituted by outwardly projecting, integral ears 49 formed

in the body of the second toggle link 29 rearwardly of the second pivot pin 33.

Detent means are provided in the forward edges of the side walls 46 of the combined locking and releasing handle 45. The detent means, in the present embodiment of my invention, consists of notches 51 which are adapted to engage the integral ears 49 formed upon the second toggle link 29. The second toggle link 29 has a rearwardly extending portion 52 in the end of which is formed a hole 53 adapted to receive the end of a coil spring 54, the other end of which is secured upon an inwardly projecting integral tongue 55 on the combined locking and releasing handle 45. The coil spring 54 urges the combined locking and releasing handle 45 forward over the surface of the second toggle link 29 and causes the detent means 49 of the second toggle link 29 to engage the detent means 51 of the combined locking and releasing handle 45, thus causing said second toggle link and said handle to be separably joined in order that they may cooperate in locking the movable jaw 17 against an object. A finger grip 57 is formed upon the combined locking and releasing handle 45 to facilitate the rearward movement of the combined locking and releasing handle in a manner to be described below. The sides 46 of the handle 45 are so extended in the central portion of the handle as to provide cams 58 which are adapted to contact the underside of the handle 11 of the wrench 10.

When an object 19 is to be clamped between the nonmovable jaw 14 and the movable jaw 17 the adjusting screw 24 is advanced within the interior of the handle 11 and its movement is transmitted through the toggle linkage 27 to the jaw mounting plate 16 which, in turn, carries the jaw 17 into contact with the surface of the object 19. Since the coil spring 54 normally retains the detent means 49 and 51 of the combined locking and releasing handle 45 and the second toggle link 29 in registry, the locking of the jaw 17 against the object 19 may be achieved by forcing the combined locking and releasing handle 45 toward the relatively stationary handle 11 of the wrench 10. The movement of the handle 45 and the second toggle link 29 in unison forces the toggle linkage 27 over center upon the third pivot pin 34 and locks the movable jaw 17 in the position into which it was initially adjusted by the adjusting screw 24. When it is desired to release the object 19 from the nonmovable jaw 14 and the movable jaw 17, the combined locking and releasing handle 45 is first moved backwards over the second toggle link 29 through the medium of the finger grip 57 of the handle 45 against the force of the coil spring 54. The rearward movement of the handle 45, as best shown in Figs. 1 and 2, disengages the detent means 51 from the detent means 49 and permits the union between the handle 45 and the second toggle link 29 to be broken.

When the detent means 49 is completely disengaged from the detent means 51, the handle 45 may then be moved inwardly toward the relatively stationary handle 11. The inward movement of the handle 45 causes the cams 58 of the handle 45 to impinge upon the underside of the handle 11 and the cams 58 thus provide a fulcrum for the force supplied by the hand of the user. As the handle 45 is brought toward the relatively stationary handle 11 the pivot pin 34 is carried away from the handle

11 over the center line of the toggle and the jaw mounting plate 16 and its associated movable jaw 17 are carried away from the object 19.

When the user releases his grip the spring 54 moves the handle 45 forward over the second toggle link 29, causing the detent means 49 and 51 to re-engage and automatically putting the wrench in readiness for the next gripping operation.

I thus provide by my invention a vise-type wrench which may be readily released from an object upon which it has been clamped and which may be so released with only one hand. I also provide a vise-type wrench which is so constructed that a greater mechanical advantage is provided to the user when the wrench is released from an object than when the wrench is initially applied to the object.

Although I have shown and described a preferred embodiment of my device, it will be appreciated that other elements may be substituted for the particular elements shown herein without departing from the spirit of the invention, and I therefore do not intend to be limited to the specific construction shown, and desire to be afforded the full scope of the following claims.

I claim as my invention:

1. A vise-grip wrench comprising: a first pivot pin; a handle member on which said first pin is carried, said handle member having a fixed jaw on its upper portion above said first pin and a handle portion extending downwardly below said first pin; an adjusting bolt threaded in the lower end of said handle with its head below the end of said handle, the axis of said bolt pointing in the general direction of said first pin; a movable jaw member having a movable jaw so placed on its upper portion as to grip an object placed between said jaws; a second pivot pin carried on said movable jaw member, said second pin being positioned to the left of a plane passing through the axis of said first pin and between the jaws, the axis of said second pin being parallel to the axis of said first pin; a first toggle link pivoted at its upper end on said second pin and carrying a third pivot pin, said first toggle link having an extension below said third pin; a second toggle link pivoted at its upper end on said third pin, its lower end abutting against the upper end of said adjusting bolt; a locking and releasing handle bent in channel form, the flanges of said channel extending inwardly from the web of the channel and enclosing the junction of said first and second toggle links, each of said flanges having a short slot therein, said slots being approximately parallel to the web of the channel and said third pin projecting through and sliding freely in said slots; spring means pulling said locking and releasing handle upwardly so that the third pin is held normally in the bottom of said slot; mutually engaging means between said first toggle link above said third pin and the upper end of said locking and releasing handle so placed that said locking and releasing handle is locked to and can actuate said first toggle link; and a projection on said locking and releasing handle which contacts said handle portion of said stationary handle member at a point below said third pin when the toggle formed of said first and second toggle links is near its locked position.

2. A vise-grip wrench comprising: a first pivot pin; a handle member on which said first pin is carried, said handle member having a fixed

jaw on its upper portion above said first pin and a handle portion extending downwardly below said first pin; an adjusting bolt threaded in the lower end of said handle with its head below the end of said handle, the axis of said bolt pointing in the general direction of said first pin; a movable jaw member having a movable jaw so placed on its upper portion as to grip an object placed between said jaws; a second pivot pin carried on said movable jaw member, said second pin being positioned to the left of a plane passing through the axis of said first pin and between the jaws, the axis of said second pin being parallel to the axis of said first pin; a first toggle link pivoted at its upper end on said second pin and carrying a third pivot pin, said first toggle link having an extension below said third pin; a second toggle link pivoted at its upper end on said third pin, its lower end abutting against the upper end of said adjusting bolt; a locking and releasing handle bent in channel form, the flanges of said channel extending inwardly from the web of the channel and enclosing the junction of said first and second toggle links, each of said flanges having a short slot therein, said slots being approximately parallel to the web of the channel and said third pin projecting through and sliding freely in said slots; spring means pulling said locking and releasing handle upwardly so that the third pin is held normally in the bottom of said slot; a finger grip projecting from said locking and releasing handle near the top thereof to assist a user in pulling the locking and releasing handle downwardly against the pull of said spring; mutually engaging means between said first toggle link above said third pin and the upper end of said locking and releasing handle so placed that said locking and releasing handle is locked to and can actuate said first toggle link; and a projection on said locking and releasing handle which contacts said handle portion of said stationary handle member at a point below said third pin when the toggle formed of said first and second toggle links is near its locked position.

3. A vise-grip wrench comprising: a first pivot pin; a handle member on which said first pin is carried, said handle member having a fixed jaw on its upper portion above said first pin and a handle portion extending downwardly below said first pin; an adjusting bolt threaded in the lower end of said handle with its head below the end of said handle, the axis of said bolt pointing in the general direction of said first pin; a movable jaw member having a movable jaw so placed on its upper portion as to grip an object placed between said jaws; spring means acting between said movable jaw member and said handle member to rotate said movable jaw member about said first pin in a counterclockwise direction; a second pivot pin carried on said movable jaw member, said second pin being positioned to the left of a plane passing through the axis of said first pin and between the jaws, the axis of said second pin being parallel to the axis of said first pin; a first toggle link pivoted at its upper end on said second pin and carrying a third pivot pin, said first toggle link having an extension below said third pin; a second toggle link pivoted at its upper end on said third pin, its lower end abutting against the upper end of said adjusting bolt; a locking and releasing handle bent in channel form, the flanges of said channel extending inwardly from the web of the channel and enclosing the junction of said first and second toggle links, each of said flanges having a short slot therein, said slots being approximately parallel to the web of the channel and said third pin projecting through and sliding freely in said slots; spring means pulling said locking and releasing handle upwardly so that the third pin is held normally in the bottom of said slot; mutually engaging means between said first toggle link above said third pin and the upper end of said locking and releasing handle so placed that said locking and releasing handle is locked to and can actuate said first toggle link; and a projection on said locking and releasing handle which contacts said handle portion of said stationary handle member at a point below said third pin when the toggle formed of said first and second toggle links is near its locked position.

4. A vise-grip wrench comprising: a first pivot pin; a handle member on which said first pin is carried, said handle member having a fixed jaw on its upper portion above said first pin and a handle portion extending downwardly below said first pin; an adjusting bolt threaded in the lower end of said handle with its head below the end of said handle, the axis of said bolt pointing in the general direction of said first pin; a movable jaw member having a movable jaw so placed on its upper portion as to grip an object placed between said jaws; spring means acting between said movable jaw member and said handle member to rotate said movable jaw member about said first pin in a counterclockwise direction; a second pivot pin carried on said movable jaw member; said second pin being positioned to the left of a plane passing through the axis of said first pin and between the jaws, the axis of said second pin being parallel to the axis of said first pin; a first toggle link pivoted at its upper end on said second pin and carrying a third pivot pin, said first toggle link having an extension below said third pin; a second toggle link pivoted at its upper end on said third pin, its lower end abutting against the upper end of said adjusting bolt; a locking and releasing handle bent in channel form, the flanges of said channel extending inwardly from the web of the channel and enclosing the junction of said first and second toggle links, each of said flanges having a short slot therein, said slots being approximately parallel to the web of the channel and said third pin projecting through and sliding freely in said slots; spring means pulling said locking and releasing handle upwardly so that the third pin is held normally in the bottom of said slot; mutually engaging means between said first toggle link above said third pin and the upper end of said locking and releasing handle so placed that said locking and releasing handle is locked to and can actuate said first toggle link; and a projection on said locking and releasing handle which contacts said handle portion of said stationary handle member at a point below said third pin when the toggle formed of said first and second toggle links is near its locked position.

5. A vise-grip wrench comprising: a first pivot pin; a handle member on which said first pin is carried, said handle member having a fixed jaw on its upper portion above said first pin and a

handle portion extending downwardly below said first pin; a thrust member carried on said handle member; a movable jaw member having a movable jaw so placed on its upper portion as to grip an object placed between said jaws; a second pivot pin carried on said movable jaw member, said second pin being positioned to the left of a plane passing through the axis of said first pin and between the jaws, the axis of said second pin being parallel to the axis of said first pin; a first toggle link pivoted at its upper end on said second pin and carrying a third pivot pin, said first toggle link having an extension below said third pin; a second toggle link pivoted at its upper end on said third pin, its lower end abutting against said thrust member on said handle member; a locking and releasing handle bent in channel form, the flanges of said channel extending inwardly from the web of the channel and enclosing the junction of said first and second toggle links, each of said flanges having a short slot therein, said slots being approximately parallel to the web of the channel and said third pin projecting through and sliding freely in said slots; spring means pulling said locking and releasing handle upwardly so that the third pin is held normally in the bottom of said slot; mutually engaging means between said first toggle link above said third pin and the upper end of said locking and releasing handle so placed that said locking and releasing handle is locked to and can actuate said first toggle link; and a projection on said locking and releasing handle which contacts said handle portion of said stationary handle member at a point below said third pin when the toggle formed of said first and second toggle links is near its locked position.

6. A vise-grip wrench comprising: a first pivot pin; a handle member on which said first pin is carried, said handle member having a fixed jaw on its upper portion above said first pin and a handle portion extending downwardly below said first pin; a thrust member carried on said handle member; a movable jaw member having a movable jaw so placed on its upper portion as to grip an object placed between said jaws; a second pivot pin carried on said movable jaw member, said second pin being positioned to the left of a plane passing through the axis of said first pin and between the jaws, the axis of said second pin being parallel to the axis of said first pin; a first toggle link pivoted at its upper end on said second pin and carrying a third pivot pin, said first toggle link having an extension below said third pin; a second toggle link pivoted at its upper end on said third pin, its lower end abutting against said thrust member on said handle member; a locking and releasing handle bent in channel form, the flanges of said channel extending inwardly from the web of the channel and enclosing the junction of said first and second toggle links, each of said flanges having a short slot therein, said slots being approximately parallel to the web of the channel and said third pin projecting through and sliding freely in said slots; spring means pulling said locking and releasing handle upwardly so that the third pin is held normally in the bottom of said slot; a finger grip projecting from said locking and releasing handle near the top thereof to assist a user in pulling the locking and releasing handle downwardly against the pull of said spring; mutually engaging means between said first toggle link above said third pin and the upper end of said locking and releasing handle so placed that said locking and releasing handle is locked to and can actuate said first toggle link; and a projection on said locking and releasing handle which contacts said handle portion of said stationary handle member at a point below said third pin when the toggle formed of said first and second toggle links is near its locked position.

7. A vise-grip wrench comprising: a first pivot pin; a handle member on which said first pin is carried, said handle member having a fixed jaw on its upper portion above said first pin and a handle portion extending downwardly below said first pin; a thrust member carried on said handle member; a movable jaw member having a movable jaw so placed on its upper portion as to grip an object placed between said jaws; spring means acting between said movable jaw member and said handle member to rotate said movable jaw member about said first pin in a counterclockwise direction; a second pivot pin carried on said movable jaw member, said second pin being positioned to the left of a plane passing through the axis of said first pin and between the jaws, the axis of said second pin being parallel to the axis of said first pin; a first toggle link pivoted at its upper end on said second pin and carrying a third pivot pin, said first toggle link having an extension below said third pin; a second toggle link pivoted at its upper end on said third pin, its lower end abutting against said thrust member on said handle member; a locking and releasing handle bent in channel form, the flanges of said channel extending inwardly from the web of the channel and enclosing the junction of said first and second toggle links, each of said flanges having a short slot therein, said slots being approximately parallel to the web of the channel and said third pin projecting through and sliding freely in said slots; spring means pulling said locking and releasing handle upwardly so that the third pin is held normally in the bottom of said slot; mutually engaging means between said first toggle link above said third pin and the upper end of said locking and releasing handle so placed that said locking and releasing handle is locked to and can actuate said first toggle link; and a projection on said locking and releasing handle which contacts said handle portion of said stationary handle member at a point below said third pin when the toggle formed of said first and second toggle links is near its locked position.

8. A vise-grip wrench comprising: a first pivot pin; a handle member on which said first pin is carried, said handle member having a fixed jaw on its upper portion above said first pin and a handle portion extending downwardly below said first pin; a thrust member carried on said handle member; a movable jaw member having a movable jaw so placed on its upper portion as to grip an object placed between said jaws; spring means acting between said movable jaw member and said handle member to rotate said movable jaw member about said first pin in a counterclockwise direction; a second pivot pin carried on said movable jaw member, said second pin being positioned to the left of a plane passing through the axis of said first pin and between the jaws, the axis of said second pin being parallel to the axis of said first pin; a first toggle link pivoted at its upper end on said second pin and carrying a third pivot pin, said first toggle link having an extension below said third pin; a second toggle link pivoted at its upper end on said third pin, its lower end abutting against said thrust mem-

ber on said handle member; a locking and releasing handle bent in channel form, the flanges of said channel extending inwardly from the web of the channel and enclosing the junction of said first and second toggle links, each of said flanges having a short slot therein, said slots being approximately parallel to the web of the channel and said third pin projecting through and sliding freely in said slots; spring means pulling said locking and releasing handle upwardly so that the third pin is held normally in the bottom of said slot; a finger grip projecting from said locking and releasing handle near the top thereof to assist a user in pulling the locking and releasing handle downwardly against the pull of said spring; mutually engaging means between said first toggle link above said third pin and the upper end of said locking and releasing handle so placed that said locking and releasing handle is locked to and can actuate said first

toggle link; and a projection on said locking and releasing handle which contacts said handle portion of said stationary handle member at a point below said third pin when the toggle formed of said first and second toggle links is near its locked position.

BRUCE BURNS.

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