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TOGGLE WRENCH WITH SLIDABLE ADJUSTMENT FOR MOVABLE JAW

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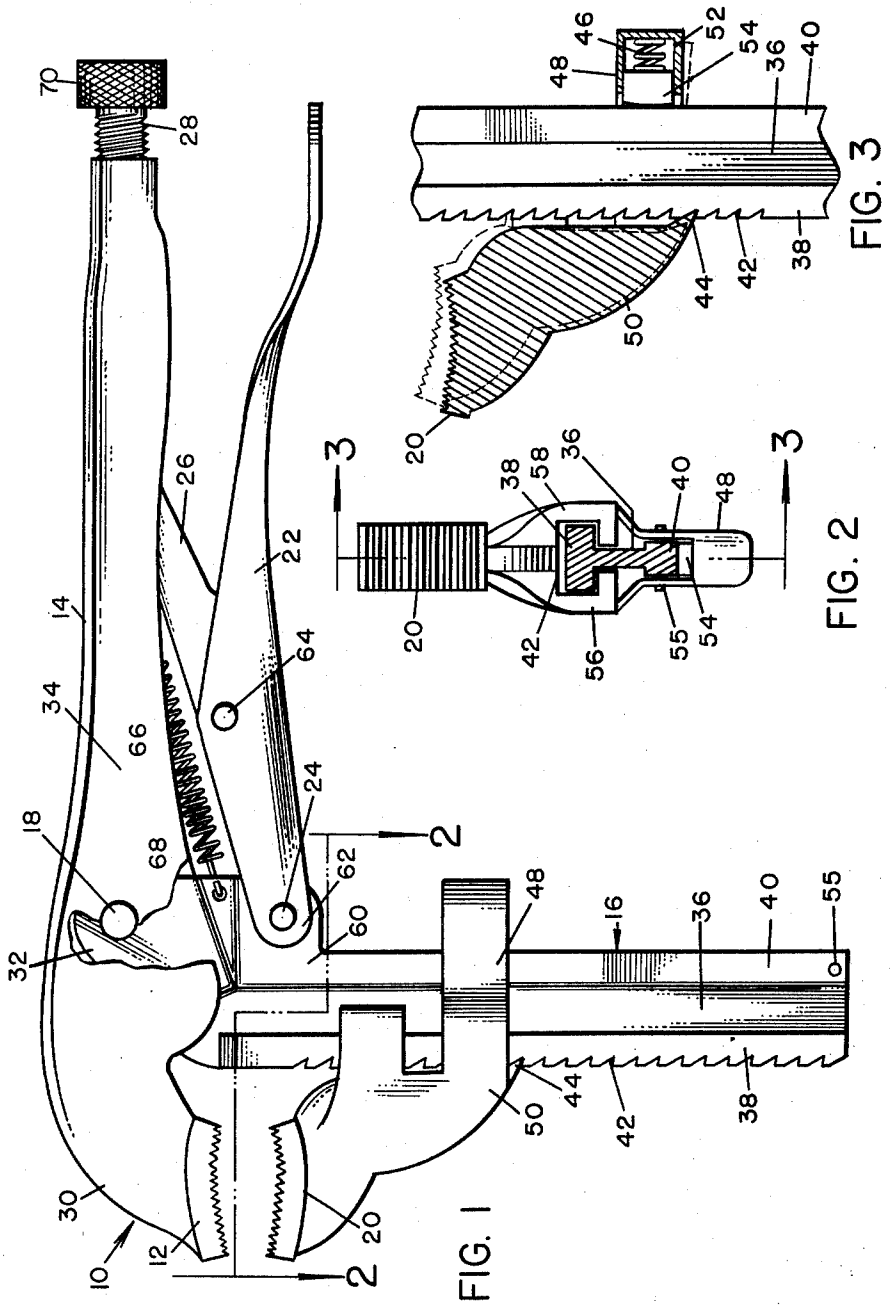


FIG. 1

FIG. 3

FIG. 2

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TOGGLE WRENCH WITH SLIDABLE ADJUSTMENT FOR MOVABLE JAW

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This invention relates to combination quick-set and vise-grip wrenches wherein toggle action levers in the handles of a wrench urge a movable jaw toward a stationary jaw with a gripping action, and in particular a wrench having a stationary jaw on the end of a handle, and a movable jaw slidably mounted on a shank extended from and pivotally mounted in the handle of the stationary jaw, the movable jaw having a pawl positioned to coact with ratchet teeth of the shank, and being actuated by the toggle acting levers to clamp the jaws against work positioned between the jaws.

The purpose of this invention is to provide a wrench of the vise grip or quick-set type in which the utility thereof is substantially unlimited.

The use of wrenches of the lever action or vise grip type is limited to gripping objects to prevent turning as nuts are turned on or removed from such objects, and quick set wrenches are restricted to turning nuts and bolts. The use of such wrenches is, therefore, limited and with this thought in mind this invention contemplates a single tool that may be used for gripping objects and also for turning nuts, bolts and the like.

The object of this invention is to provide a combination tool including quick-set and vise-grip actions so that it is only necessary for a workman to carry a single tool instead of two separate tools.

Another object of the invention is to provide a combination quick-set and vise-grip tool in which the gripping elements thereof are adjustable.

Another important object is to provide means for readily adjusting the position of the movable jaw of a vise-grip wrench.

A further object of the invention is to provide a relatively small tool in which gripping jaws thereof may readily be set to grip comparatively large objects.

A still further object of the invention is to provide a quick-set movement on a vise-grip wrench in which the wrench is of a simple and economical construction.

With these and other objects and advantages in view the invention embodies a wrench having a stationary jaw at the end of a handle, a shank pivotally mounted in the handle, a movable jaw slidably mounted on the shank, and toggle acting levers in the handle and positioned to provide a vise-grip action.

Other features and advantages of the invention will appear from the following description taken in connection with the drawings, wherein:

Figure 1 is a side elevational view of the improved quick-set and vise-grip wrench with a portion of the handle broken away to illustrate the mounting of a shank therein.

Figure 2 is a sectional plan through the wrench taken on line 2—2 of Figure 1.

Figure 3 is a portion of a longitudinal section through the intermediate part of the wrench taken on line 3—3 of Figure 2 showing the pawl of the movable jaw in gripping relation with the ratchet teeth of the shank.

While one embodiment of the invention is illustrated in the above referred to drawings, it is to be understood that they are merely for the purpose of illustration, and that various changes in construction may be resorted to in the course of manufacture in order that the invention may be utilized to the best advantage according to circumstances which may arise, without in any manner departing from the spirit and intention of the device, which is to be limited only in accordance with the appended claims. And while there is stated the primary field of utility of the invention, it remains obvious that it may be employed in any other capacity wherein it may be found applicable.

In the accompanying drawings, and in the following specification, the same reference characters are used to designate the same parts and elements throughout, and in which the numeral **10** refers to the invention in its entirety, numeral **12** indicating a stationary jaw on the end of a handle **14**, the handle being U-shaped in cross section, numeral **16** a shank pivotally mounted by a pin **18** in the handle of the stationary jaw, numeral **20** a movable jaw slidably mounted on the shank **16**, and numeral **22** a lever pivotally mounted by a pin **24** on the shank and positioned to coact with the handle to provide a toggle action through a bar **26** and an adjusting screw **28**.

The stationary jaw **12**, which is of arcuate design, is carried by a stock **30** that extends from the handle **14**, and the handle, which is U-shaped in cross section, receives a tongue **32** that extends from the upper end of the shank **16**. The pin **18** extends through the tongue and side walls **34** of the handle providing a pivotal mounting of the shank in the handle.

The shank **16** is T-shaped in cross section, having a web **36** with a wide flange **38** on one side and a narrow flange **40** on the opposite side. The flange **38** is provided with ratchet teeth **42** that coact with a pawl **44** on the lower part of the movable jaw, as shown in Figure 3, and the pawl is urged into engagement with the ratchet teeth by a spring **46** in an extension **48** on a lower portion **50** of the jaw. The spring, which is positioned in a cavity **52** in the extension, urges a block **54** against the flange **40** of the shank, and, as indicated by the broken lines in Figure 3, pressure on the end of the extension **48** moves the pawl **44** away from the ratchet teeth so that the movable jaw may be adjusted to different positions on the shank. The lower end of the shank is provided with a stop pin **55** to prevent accidental displacement of the jaw **20**.

The lower portion **50** of the movable jaw extends around the shank, and the upper portion of the jaw is provided with arms **56** and **58** that extend over the edges of the flange **38** whereby the lower, or movable jaw, which is also arcuate in elevation, is retained in registering relation with the stationary jaw **12**.

The upper end of the flange **40** is provided with a tongue **60** on the sides of which ears **62** of the lever **22** are positioned, and the pin **24** by which the lever **22** is pivotally mounted, extends through the ears and tongue. The bar **26** is pivotally mounted by a pin **64** in the lever **22** and the opposite end of the bar extends into the handle and engages the inner end of the adjusting screw **28**.

The shank and lower or movable jaw are urged in a counterclockwise direction wherein the movable jaw is moved away from the stationary jaw by a spring **66**, one end of which is secured in the handle **14** and the other in an opening **68** in the tongue **32** of the shank. By this means the movable jaw is drawn away from the stationary jaw as soon as the lever **22** is released.

Operation

With the parts assembled as illustrated and described the extension **48** on the end of the movable jaw is pressed inwardly to release the pawl and the movable jaw is

moved along the shank to engage a nut, bolt, or other work, and with the adjusting screw **28** turned by the knurled head **70**, to the correct position, the lever **22** is drawn toward the handle until the center of the pin **64** passes over the center, in which position, the parts are locked with the jaws gripping an object. With the parts set in such positions the jaws will remain in the same gripping relation until the position of the movable jaw is changed by the adjusting screw.

From the foregoing specification it will become apparent that the invention disclosed will adequately accomplish the functions for which it has been designed and in an economical manner, and that its simplicity, accuracy, and ease of operation are such as to provide a relatively inexpensive device, considering what it will accomplish, and that it will find an important place in the art to which it appertains when once placed on the market.

It is thought that persons skilled in the art to which the invention relates will be able to obtain a clear understanding of the invention after considering the description in connection with the drawings. Therefore, a more lengthy description is regarded as unnecessary.

Changes in shape, size, and arrangement of details and parts such as come within the purview of the invention claimed may be resorted to in actual practice, if desired.

Having now described the invention that which is claimed to be new and desired to be procured by Letters Patent, is:

1. In a wrench, the combination which comprises a stationary jaw, a handle, U-shaped in cross section, extended from and integral with the stationary jaw, a shank having a tongue extended into the handle, a pin pivotally connecting the tongue to the handle, said shank having ratchet teeth on one edge, a movable jaw slidably mounted on the shank and having a pawl positioned to coact with the ratchet teeth, the movable jaw being in registering relation with the stationary jaw, a lever pivotally mounted on the shank and extended in operative relation to the handle, a bar pivotally connected to the lever and extended into the handle, an adjusting screw threaded in the handle and positioned to engage the end of the bar extended into the handle, and a spring connected to the handle and shank for actuating the shank to draw the movable jaw from the stationary jaw.

2. In a vise-grip wrench, the combination which comprises a stationary jaw having an arcuate gripping surface, a handle, U-shaped in cross section, extended from the stationary jaw, a shank having a tongue extended from one end, the shank being positioned with the tongue thereof extended into the handle, a pin extended through the tongue of the shank and walls of the handle pivotally mounting the shank in the handle, a movable jaw slidably mounted on the shank, latching teeth positioned on the shank, a pawl on the movable jaw positioned to engage the latching teeth to retain the movable jaw in gripping relation with an object positioned against the stationary jaw, the movable jaw also having an arcuate gripping surface, a lever pivotally connected to the shank and extended to coact with the handle for urging the jaws to gripping positions, a bar pivotally connected to the lever and extended into the handle, an adjusting screw threaded in the handle and positioned to engage the bar extended from the lever, and resilient means for urging the movable jaw away from the stationary jaw.

3. In a wrench, the combination which comprises a stationary jaw, a handle, U-shaped in cross section, extended from and integral with the stationary jaw, a shank having a tongue extended into the handle, a pin pivotally connecting the tongue to the handle, said shank having ratchet teeth on one edge, a movable jaw slidably mounted on the shank and having a pawl positioned to coact with the ratchet teeth, the movable jaw being in registering relation with the stationary jaw, a lever pivotally mounted on the shank and extended in operative relation to the handle, a bar pivotally connected to the lever and extended into the handle, and means attached to said handle and positioned to engage the end of the bar extended into the handle.

4. In a wrench, the combination which comprises a stationary jaw, a handle, U-shaped in cross section, extended from and integral with the stationary jaw, a shank having a tongue extended into the handle, said shank extending at a right angle to said elongated handle, a pin pivotally connecting the tongue to the handle, said shank having ratchet teeth on one edge, a movable jaw slidably mounted on said shank, the movable jaw being in registering relation with the stationary jaw, a lever pivotally mounted on the shank and extended in operative relation to the handle, a bar pivotally connected to the lever and extended into the handle, and means on said movable jaw cooperating with said ratchet teeth for selectively positioning and for maintaining said jaw in a desired position on said shank during gripping.

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