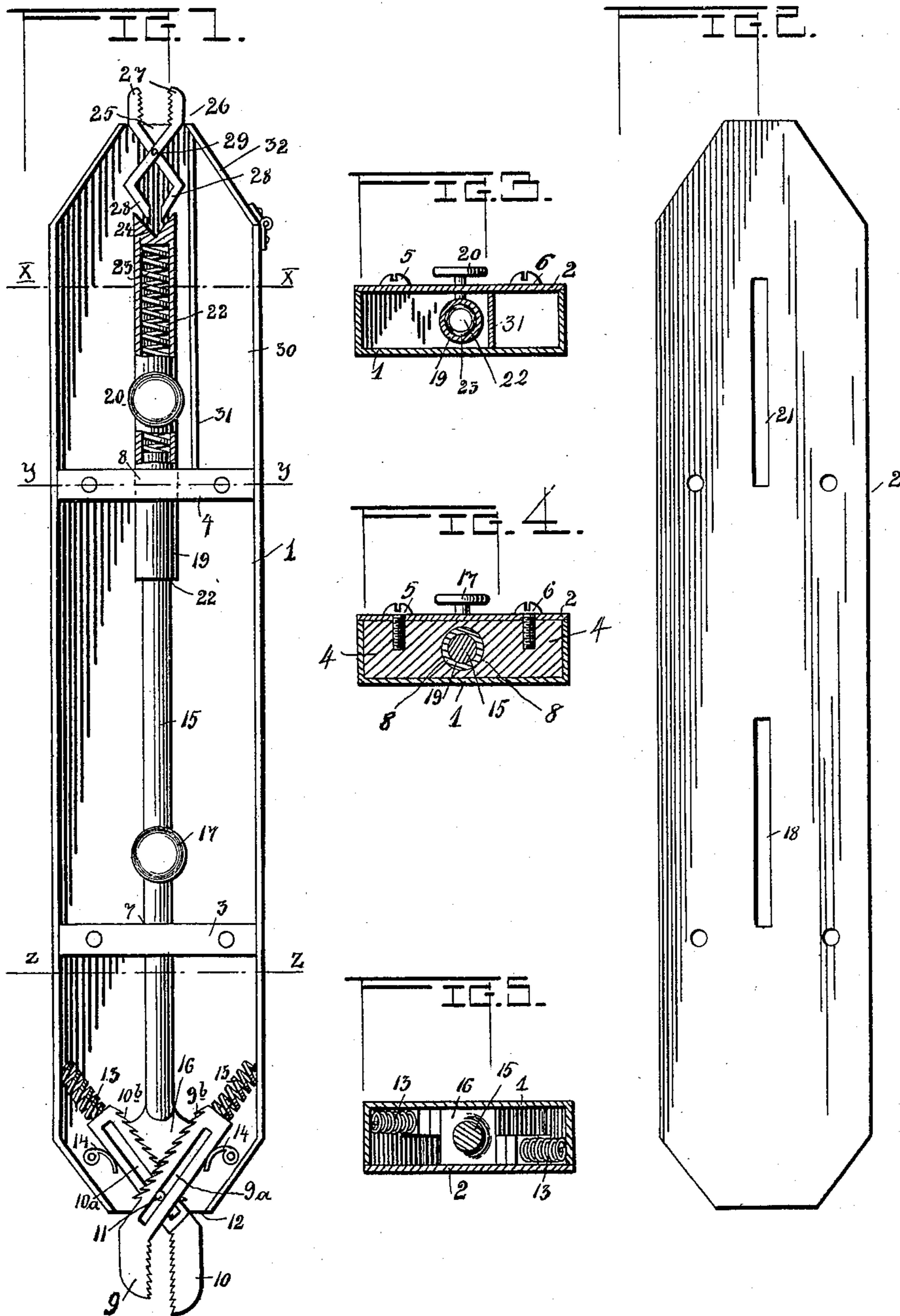


(No Model.)

C. BICKEL.  
COMBINATION WRENCH.

No. 598,897.

Patented Feb. 15, 1898.



WITNESSES

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# UNITED STATES PATENT OFFICE.

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## COMBINATION-WRENCH.

SPECIFICATION forming part of Letters Patent No. 598,897, dated February 15, 1898.

Application filed June 17, 1897. Serial No. 641,092. (No model.)

*To all whom it may concern:*

Be it known that I, CASPER BICKEL, a citizen of the United States, residing at Shelburne Falls, in the county of Franklin and State of Massachusetts, have invented certain new and useful Improvements in Combination-Wrenches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a wrench which is adapted for use both as a nut-wrench and a pipe-wrench or tongs and for various other useful purposes.

The object of my invention is to provide a combination-wrench which is very convenient in use and the operating parts of which are quickly adjustable and partially automatic, and which is so constructed as to comprise several different kinds of tools in one.

The parts and combinations of parts constituting my invention will be defined in the claims.

I will now describe the details of construction of my combination-wrench by reference to the accompanying drawings, in which—

Figure 1 represents a top plan view of the wrench with the cover removed for showing the operating parts. Fig. 2 represents a top plan view of the cover. Fig. 3 represents a transverse section on the line  $x x$ , Fig. 1. Fig. 4 represents a transverse section on the line  $y y$ , Fig. 1. Fig. 5 represents a transverse section as viewed from above on line  $z z$ , Fig. 1.

The working parts of my wrench are inclosed in a sheet-metal case 1, preferably of steel and having a removable cover 2. Near the opposite end of the case 1 are secured the transverse braces 3 and 4, having screw-holes, as shown, to which are secured the cover by the screws 5 and 6. Holes 7 and 8 are made centrally in the braces 3 and 4 in a line with the central longitudinal axis of the wrench for receiving and supporting the locking-bars 15 and 19.

At the lower end of the casing are placed the two adjustable jaws 9 and 10, passing out through the end opening 12. These jaws are angular, as shown, and the interior shanks or bodies are provided with longitudinal slots 9<sup>a</sup>

and 10<sup>a</sup>; with which there engages the transverse pin 11, which acts as a guide and support for the jaws. To the opposite sides of the casing and just above the inner ends of the jaws are secured the two spiral springs 13, which bear upon the inner ends of the jaws and act to thrust them outward. Short pins or studs project from the inner ends of the jaws for engaging with the spiral springs. The inner portions of the jaws are provided upon their adjacent edges with serrations 9<sup>b</sup> and 10<sup>b</sup>, which are inclined forward, as shown, for engaging with similar serrations upon the V-shaped head 16 of the locking-bar 15. The outer ends or gripping portions of the jaws are also serrated, the teeth preferably being inclined in opposite directions in the opposite jaws, so as to better serve as a pipe-wrench, though the serrations may be made without being inclined forward or backward in either jaw. Near the lower end of the casing are secured two stiff flat springs 14 14, bearing upon the outer edges of the inner ends of the jaws, so as to throw them inward and hold them in engagement with the serrated head 16 of the locking-bar.

The locking-bar 15 passes through the central opening 7 in the brace 3, and at its upper end extends into the socket 22 of the upper locking-bar 19. A knob or button 17 is screwed by its stem or otherwise attached to bar 15, and the stem of said button passes through the longitudinal slot 18 in the cover, as shown in Fig. 2.

The upper locking-bar 19 is provided with the interior longitudinal socket 22 to receive the spiral spring 23 and the upper end of bar 15 and passes through a central opening 8 in the brace 4, by which it is supported. The spiral spring 23 bears at its lower end upon the bar 15 and at its upper end upon the bar 19 within the socket, so as to force the bars outward toward the opposite ends of the casing for locking the wrench-jaws at each end. A knob or button 20, having a short stem, is screwed into or otherwise attached to the tubular bar 19, and its stem passes through the slot 21 in the cover 2. The upper end of bar 19 is made with a V-shaped notch 24 for bearing upon the inwardly-bent lever-handles 28.

The grip or wrench 26 is provided with suitable jaws 27 for receiving the shanks of small

tools—such as a screw-driver, gimlet, &c.—which jaws are pivotally connected by a pin 29 to the casing and extend through the opening 25 in the end of the casing. The rear extensions of the jaws 27 are in the form of angular lever-handles 28, bent inward to fit the V-shaped notch 24 of the locking-bar 19. Since the locking-bar 19 is tubular and the upper end of the bar 15 works in its socket, each bar acts as a guide for the other one.

In the upper end of the casing I make a tool-pocket 30 by securing a longitudinal partition 31, composed of a steel plate extending between the brace 4 and the top and bottom of the casing to the outer end of the same. An end cap 32 can be secured in place by a screw-threaded connection or by springs or in any other desired manner.

To operate the wrench, the jaws 9 10 are spread apart and the locking-bar 15 pulled up, when the springs 13 will push the jaws outward to fit any nut. Then the arm 15 is let down, when its serrated end will engage the serrations 9<sup>b</sup> and 10<sup>b</sup> on the jaws, and the springs 14 will push in the jaws, locking the parts together. The bar 15 having been pulled up by the knob 17, it will, as soon as released, be pushed down by the spiral spring 23. The flat springs 14 will keep the jaws in place and act as a guide.

If it is desired to use the device as a pipe-wrench, the pointed jaw 9 should be kept somewhat retracted, as shown in the drawings, and allowing it to remain stationary the jaw 10 is pulled downward and outward just enough to give the upper one a good hold on the pipe. Then the locking-bar 15 is set and caused to engage the serrations on the two jaws. The device can now be conveniently used as a pipe-wrench. It will thus be seen that the device can by a little adjustment be used both for a nut-wrench and a pipe-wrench.

When it is desired to use the grip or wrench 26, the bar 19 is pulled down by its knob 20 and the shank of a screw-driver, gimlet, or other small tool is placed between the jaws 27 and then the bar 19 is released, when the spiral spring will push it up against the bent handles 28 and tightly close the jaws. The spiral spring 23 constantly forces both the locking-bars 15 and 19 outward, so that they always bear upon the jaws at the opposite ends of the casing.

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

1. In a wrench, the combination with the casing, of two yieldingly-supported jaws, having serrations upon their back edges and a sliding locking-bar having serrations upon two opposite edges or faces, adapted to en-

gage with the serrations upon said jaws, substantially as described.

2. In a wrench, the combination with the casing, of two yieldingly-supported and intersecting jaws, having serrations upon their back edges, a sliding locking-bar having serrations upon opposite faces, adapted to engage with the serrations on said jaws, and two springs bearing upon the inner ends of said jaws and adapted for automatically forcing them outward when released from the locking-bar, substantially as described.

3. In a wrench, the combination with the casing, of two intersecting and yieldingly-supported jaws, having serrations upon their back edges, and a spring-pressed sliding locking-bar having serrations upon opposite faces, adapted to engage with the serrations on said jaws, substantially as described.

4. In a wrench, the combination with the casing, of two intersecting and yieldingly-supported jaws, having serrations upon their back edges, a sliding locking-bar having serrations upon opposite faces, engaging with said serrations on the jaws and two springs, 14, 14, bearing upon the opposite edges of said jaws, to force them against said locking-bar, and act as a guide for the jaw, substantially as described.

5. In a wrench the combination with the casing, of two pairs of jaws, one supported at the upper and one at the lower end thereof, two sliding locking-bars, adapted to bear upon both sets of jaws, and a spring bearing upon both of said bars to force them against the jaws, substantially as described.

6. In a wrench the combination with the casing, of a pair of jaws at each end thereof, a sliding locking-bar, having a longitudinal socket and adapted to bear upon the upper set of jaws, a separate sliding locking-bar, bearing upon the lower jaws and sliding at its upper end in the socket of the upper bar, and a spiral spring within the socket of the upper bar and operating to force both bars outward toward the opposite ends of the casing, substantially as described.

7. In a wrench, the combination with the casing, of a pair of gripping-jaws, 26, having lever-handles with inwardly-bent ends, a sliding locking-bar, having a V-shaped end, adapted to bear against both of said handles, and a spring for forcing outward said bar, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CASPER BICKEL.

Witnesses:

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