

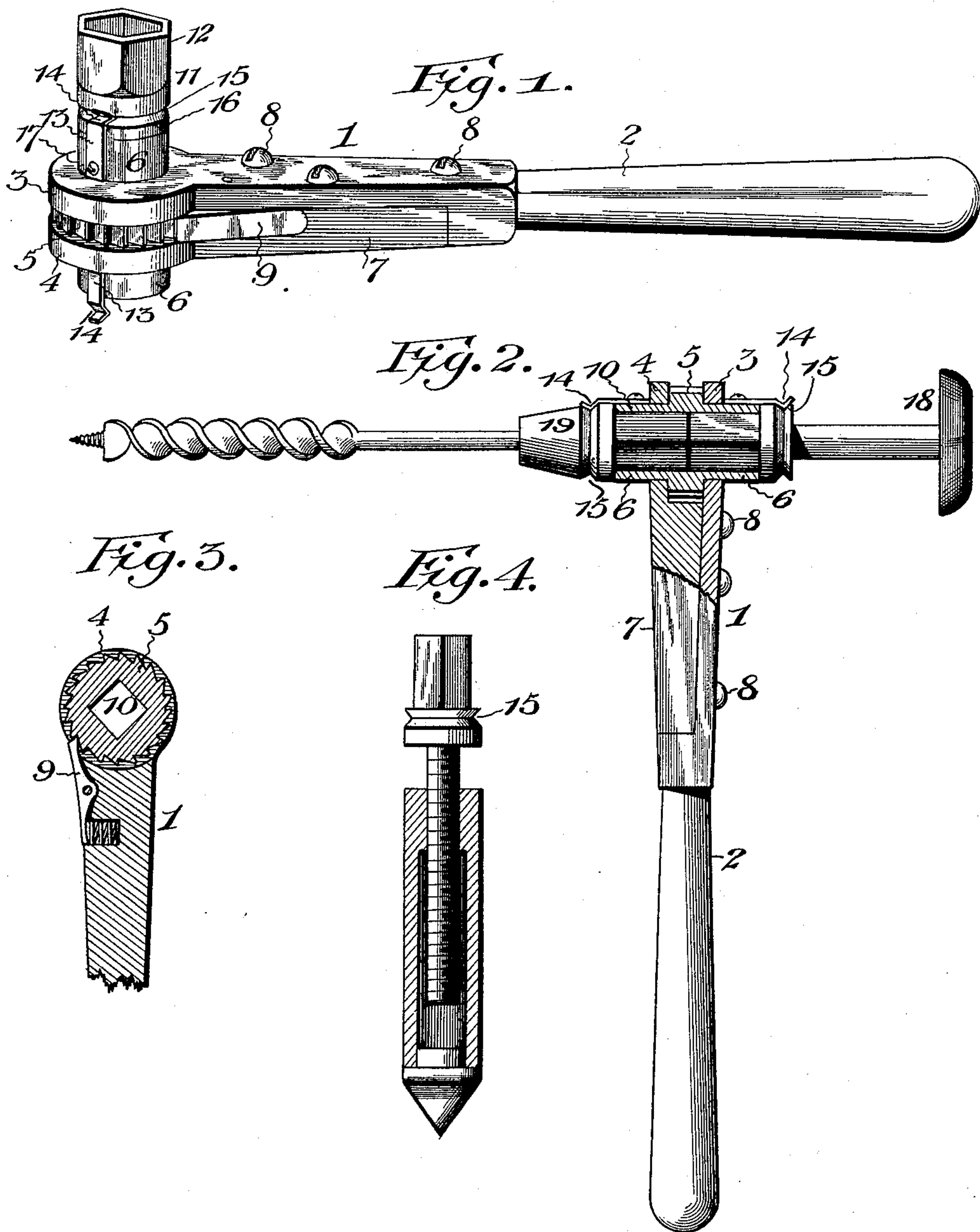
No. 613,759.

Patented Nov. 8, 1898.

E. F. COOPER.  
COMBINATION TOOL.

(Application filed Apr. 29, 1898.)

(No Model.)



Witnesses

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# UNITED STATES PATENT OFFICE.

ELIAS FRANCIS COOPER, OF MOUNT GILEAD, OHIO.

## COMBINATION-TOOL.

SPECIFICATION forming part of Letters Patent No. 613,759, dated November 8, 1898.

Application filed April 29, 1898. Serial No. 679,253. (No model.)

*To all whom it may concern:*

Be it known that I, ELIAS FRANCIS COOPER, a citizen of the United States, residing at Mount Gilead, in the county of Morrow and State of Ohio, have invented a new and useful Combination-Tool, of which the following is a specification.

The invention relates to improvements in combination-tools.

10 The object of the present invention is to improve the construction of combination-tools and to provide a ratchet device adapted to be readily arranged to form a wrench, a drill, a brace and bit, and a screw-driver and capable of driving the parts in either direction.

15 A further object of the invention is to provide a simple, inexpensive, and efficient device adapted to enable the various tools to be readily attached to and removed from the ratchet device without adjusting a screw or similar device.

20 The invention consists in the construction and novel combination and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

25 In the drawings, Figure 1 is a perspective view of a combination-tool constructed in accordance with this invention and arranged to form a nut-wrench. Fig. 2 is a side elevation, partly in section, the parts being arranged to form a brace and bit. Fig. 3 is a sectional view taken longitudinally of the shank or lever and illustrating the method of mounting the ratchet mechanism thereon. Fig. 4 is a side elevation, partly in section, of a drill adapted to be used in connection with the ratchet device.

30 Like numerals of reference designate corresponding parts in all the figures of the drawings.

35 1 designates a shank or lever having a handle portion 2 at one end and provided at the other end with perforated ears 3 and 4, spaced apart to form bearings and receiving between them a ratchet-wheel 5, which has extended hubs 6 passing through the bearing-openings of the ears of the shank or lever. The ear or bearing 3 is preferably formed integral with the shank or lever, and the other ear or bearing is carried by a detachable plate 7, secured

in a recess of the shank or lever by screws 8 or other suitable fastening devices and adapted to be removed to enable the parts to be separated and assembled. 55

The ratchet-wheel is engaged by a spring-actuated pawl 9, located at one side of the shank or lever, as clearly illustrated in Fig. 3 of the accompanying drawings. The pawl 9 permits the ratchet-wheel to rotate freely in one direction and locks it against movement in the opposite direction, and in order to render the ratchet reversible, so that a tool may be driven in either direction, the ratchet-wheel is provided with a polygonal opening 10, extending entirely through the hub and the extensions thereof, and the shank or lever is adapted to be reversed to bring either hub extension in position for receiving a tool, and by changing the same from one hub extension to the other the direction of rotation may be reversed. 60 65 70

The opening of the hub of the ratchet-wheel is adapted to receive a shank 11 of a wrench-head 12, which is provided with a nut-socket and which may be of any desired size to suit nuts of different sizes. The opening or socket of the wrench-head may be rectangular or of any other configuration to suit the character of nut to be removed, and a series of such wrench-heads may be provided, so that a wrench-head may be quickly changed in order to adapt the device for operating on any kind of a nut. When the wrench-head is arranged at one side of the ratchet-wheel, the device will be adapted for rotating the nut in one direction, and by arranging the wrench-head at the other side of the device a nut will be rotated in the opposite direction. 75 80 85

In order to enable a wrench-head or other tool to be quickly mounted on and removed from the device without adjusting or manipulating a screw or other fastening device, a spring 13 is mounted on each of the hub extensions and is provided with an outer V-shaped engaging portion 14, presenting inner oppositely-inclined engaging faces adapted to fit in a corresponding V-shaped groove 15 of the wrench-head. The shank 11 is provided at its inner end with an annular portion 16, in which is formed the annular groove 15, and it will be apparent that when suffi- 90 95 100



cient pressure is exerted in introducing the shank into the opening of the ratchet-wheel and removing it therefrom the spring will be caused to engage and release the grooved portion of the annular enlargement 16. By this construction a tool may be quickly placed in the opening of the ratchet-wheel and readily removed therefrom without adjusting a set-screw or other fastening device.

10 The spring 13, which extends longitudinally of the hub of the ratchet-wheel, is provided with a straight inner shank or portion which is secured to the ratchet-wheel by a screw 17 or other suitable fastening device.

15 The screw 17 is arranged near the inner end of the shank of the spring, which is designed to have sufficient strength to enable it to securely retain a tool in the opening of the hub of the ratchet-wheel.

20 It will be apparent that any kind of tool which requires rotation to operate it may be provided with a shank, so that it can be mounted on the ratchet device, and in Fig. 2 of the accompanying drawings the parts are arranged to form a brace and bit, a breast-plate 18 being mounted at one side of the ratchet device and a bit-socket 19 being arranged at the other side of the device. The breast-plate is mounted on a shank which has a polygonal portion to fit the hub-opening and an annular groove to be engaged by the spring. In Fig. 4 of the drawings is shown a drill having a feed-screw and provided at one end of the same with a squared shank and an annular portion having a groove to be engaged by a spring of the ratchet device.

The invention has the following advantages: The locking-spring and the annular groove are exceedingly simple and inexpensive in construction and enable various forms of tools and devices to be quickly attached to and removed from the ratchet device, so that the character of the combination-tool may be instantly changed without manipulating a set-screw or any similar clamping device. The outer engaging portion of the locking-spring has a V-shaped bend, which presents oppositely-inclined faces to the similar-shaped sides of the groove, and while it forms a perfect locking device it will enable a tool to be readily engaged with it and disengaged from

it by pressing the tool inward or drawing it outward.

Changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

What I claim is—

1. In a device of the class described, the combination with a shank or lever, a ratchet-wheel mounted thereon and provided with an opening, and a pawl engaging the ratchet-wheel, of a shank adapted to fit in the opening of the ratchet-wheel, and provided with an exterior annular groove V-shaped in cross-section, said shank being designed to be carried by a tool to enable the same to be applied to the ratchet-wheel, and a spring mounted on the exterior of the ratchet-wheel at the hub thereof, projecting beyond the same and provided at its outer end with an inwardly-extending V-shaped bend, engaging the annular groove and presenting oppositely-inclined inner faces, whereby it is adapted to engage the groove and disengage itself from the same automatically, substantially as described.

2. In a device of the class described, the combination with a shank or lever provided with perforated ears forming a bearing, a ratchet-wheel having extended hubs journaled in the perforations of the ears, a pawl engaging the ratchet-wheel, springs disposed longitudinally of the extended hubs, secured at their inner ends to the same, and having their outer portions projecting beyond the hubs and provided with inwardly-extending V-shaped bends, a shank fitted in one of the hubs and provided with an exterior annular groove V-shaped in cross-section, and a stem or shank fitted in the other hub 6, provided at its outer end with a breastplate and having an annular enlargement provided with an annular groove V-shaped in cross-section and receiving the adjacent spring, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ELIAS FRANCIS COOPER.

Witnesses:

ISADOR MAYER,  
A. B. REYNOLDS.