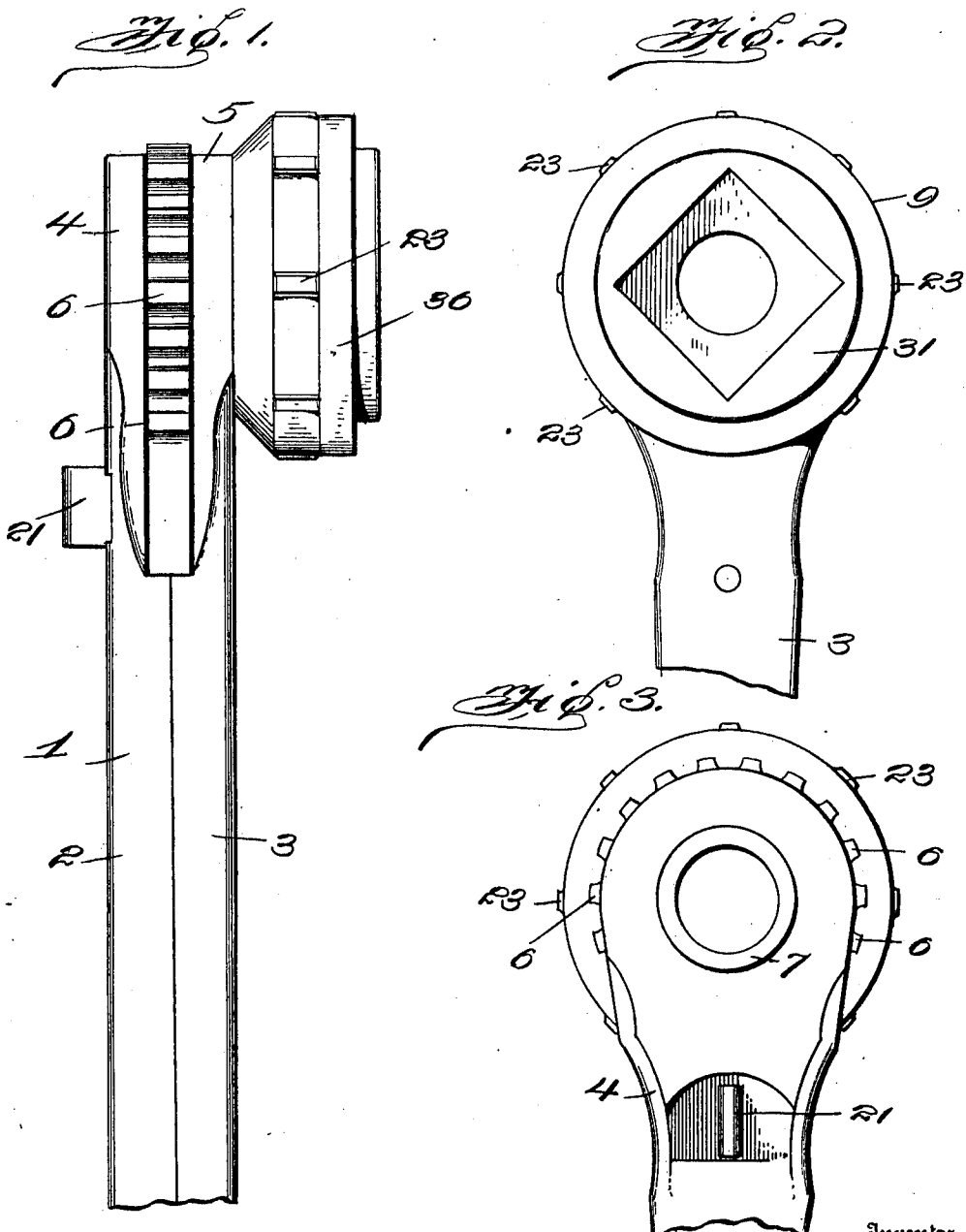


A. M. FULKERSON.
 RATCHET WRENCH.
 APPLICATION FILED JULY 16, 1909.

970,320.

Patented Sept. 13, 1910.

2 SHEETS—SHEET 1.



Inventor
Ambus M. Fulkerson.

Witnesses
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C. C. Hines.

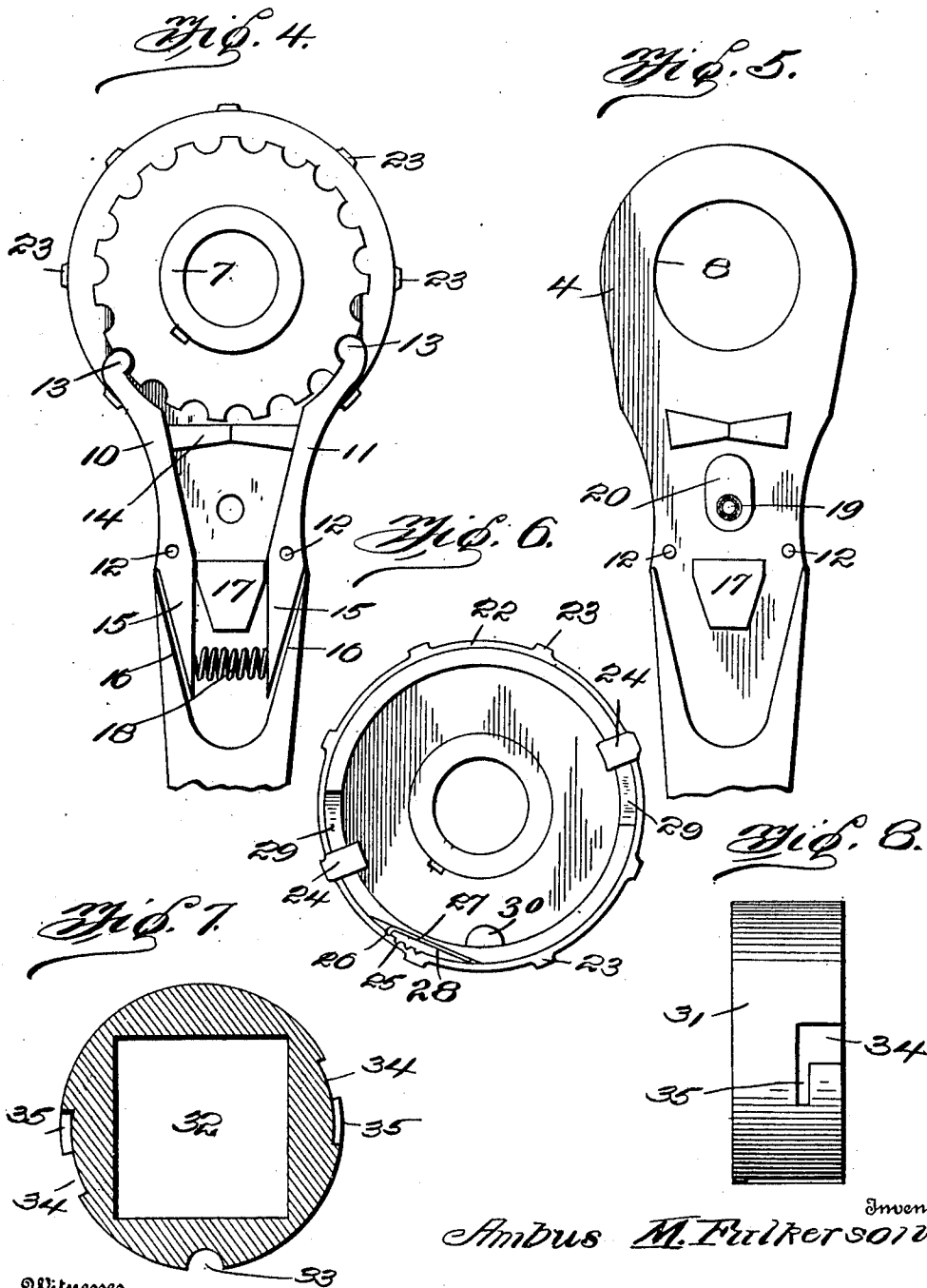
By *Victor J. Evans*
 Attorney

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UNITED STATES PATENT OFFICE.

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RATCHET-WRENCH.

970,320.

Specification of Letters Patent. Patented Sept. 13, 1910.

Application filed July 16, 1909. Serial No. 508,016.

To all whom it may concern:

Be it known that I, AMBUS M. FULKERSON, a citizen of the United States, residing at Sac and Fox Agency, in the county of Lincoln and State of Oklahoma, have invented new and useful Improvements in Ratchet-Wrenches, of which the following is a specification.

This invention relates to ratchet wrenches, the object of the invention being to provide a simple, efficient and easily-operated wrench which is reversible in action for turning on and off nuts and other objects, and is readily adapted for engaging objects varying in size.

The invention consists of the features of construction, combination and arrangement of parts hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a side elevation of a ratchet wrench embodying my invention. Fig. 2 is a front elevation of the same. Fig. 3 is a rear elevation. Fig. 4 is a front elevation with one of the handle sections removed. Fig. 5 is an inner face view of one of the handle sections. Fig. 6 is a view of the wrench head with the chuck and reinforcing collar detached. Fig. 7 is a transverse section through the chuck. Fig. 8 is a side view of the same.

Referring to the drawings, 1 designates the handle of the wrench which comprises two longitudinally divided sections 2 and 3 provided with partially circular forward end portions 4 and 5 which are spaced for the reception between them of a ratchet wheel 6. The wheel 6 is keyed or otherwise fixed to the head of the wrench, which embodies a hollow spindle 7 journaled in bearing openings 8 in the portions 4 and 5 and carries at its outer end a head proper 9 forming a socket for the reception of a chuck, as hereinafter described.

The ratchet wheel is adapted to be engaged by duplicate pawls or dogs 10 and 11 pivotally mounted to swing laterally on pivot pins 12 mounted on the handle sections. The forward ends of the pawls are provided with teeth 13 to engage the teeth of the ratchet wheels and are limited in their inward or engaging movement by contact with the ends of transverse stop bars 14 upon the portions 4 and 5 of the handle sections.

The rear ends or arms 15 of the pawls are V-shaped to provide beveled or inclined in-

ner and outer faces. The beveled outer faces are adapted to engage inclined portions 16 on the handle sections when the pawls are in retracted position, while the inner beveled faces are adapted to engage the inclined sides of substantially triangular stop blocks 17 to limit the outward movement of the acting ends of the dogs and relieve them from strain in turning a heavy or refractory object. A spring 18 is disposed between the inner ends of the dogs and normally operates to hold their teeth in engagement with the ratchet wheel. A stem 19 extends through the handle sections and carries a tumbler or adjusting device 20 which is movable between the forward ends of the pawls and is adapted to be adjusted in one direction or the other by a finger piece 21. When this device is in a central position, as shown in Fig. 5, both pawls will be in neutral or locking engagement with the ratchet wheel to hold the same from movement in either direction. By turning the tumbler, however, in one direction or the other either pawl may be projected outwardly or retracted to hold its toothed end out of engagement with the ratchet wheel.

Mounted for locking movement on the head 9 is a locking band or collar 22 provided on its exterior with spaced ribs or serrations 23 to enable it to be conveniently gripped and adjusted. This locking band or collar is provided at diametrically opposite sides with a pair of inwardly extending locking lugs 24 and is formed with a series of teeth or notches 25 on its inner surface. These teeth or notches are adapted to be engaged by the toothed end 26 of a retaining spring 27 arranged in a recess 28 between the head and band, whereby the band may be held and limited in its rotary movements between the limits afforded by the length of segmental slots 29 formed in the head through which the lugs 24 project and in which said lugs are adapted to move. The head is provided with a gage pin or projection 30 extending outwardly beyond the band at a point between the slots 29. A chuck 31 is adapted to fit within the receiving socket of the head and to be locked in position by the lugs 24 and projection 30. The form of chuck shown comprises an annular body having an angular bore or recess 32 of proper form and size to receive and engage a nut or other object to be turned on or off. The chuck is formed in its periphery with a

groove 33 to receive the projection 30 and is also provided at diametrically opposite sides and approximately at right angles to said groove with radial recesses 34 communicating at their inner ends with circumferential recesses 35.

In practice, it is designed to employ a series of chucks which may be interchangeably mounted upon the head and which are provided with bores, recesses or receiving spaces 32 varying in size according to the size of the nut or other object which is to be engaged. In applying and locking the chuck in position, the rear face of the chuck is disposed in line with the socket in the head and with the groove 33 and recesses 34 in line with the projection 30 and lugs 24. The rear portion of the chuck may be then slipped into the socket of the head, so that it will be locked against rotary movement by the projection 30. In this operation the lugs 24 will project into the recesses 34 in alignment with the recesses 35, whereupon by turning the locking band 22 the lugs will be moved into the recesses 35 to hold the chuck against outward movement from the socket. It will be understood that the spring 27 permits the band 22 to be moved back and forth, but holds it in adjusted position when turning pressure is not applied thereto. In releasing the chuck for detachment, the band 22 is turned reversely until the lugs 24 move out of the recesses 35 and into line with the recesses 34, when said chuck will be free for outward movement and may be readily withdrawn. In this manner chucks of different sizes may be substituted for one another as occasion in the use of the wrench may demand. The chuck is preferably reinforced by an annular collar 36, on which collar and the locking band 22 indicating markings may be provided for co-action to indicate when the groove 33 is in line with the projection 30, thus affording convenience in applying the chuck 2 and removing it from the head.

In operation, the chuck head is engaged with the object to be turned, and one or the other of the pawls thrown out of action, so that the remaining pawl on each turning movement of the handle in one direction will engage and rotate the head and chuck in such direction, thus enabling the nut to be conveniently turned on or off. By means of the two pawls and the controlling device 20, the wrench head may be arranged for right or left hand work and operated in either direction as circumstances or different conditions of work may require. It will be apparent that when the pawl 10 is in operation said pawl will ride over the teeth of

the ratchet wheel when the handle is turned rearwardly and will engage and move the ratchet wheel forwardly upon the forward movement of the handle, while the reverse operation will occur when the pawl 11 is in action.

From the foregoing description, taken in connection with the drawings, the construction and mode of operation of my improved ratchet wrench will be readily understood, and it will be seen that the invention provides a reversible wrench which is simple of construction, efficient in action, and capable of being easily and conveniently operated. Also that the construction of the tool is strong and durable, and that by contact with the blocks 17, the dogs will be braced in action in operating the ratchet wheel to turn refractory objects.

I claim:—

1. A wrench comprising a handle, a ratchet wheel carried thereby, spring actuated dogs to engage the ratchet wheel, means for throwing either dog into and out of operation, a head mounted to rotate upon the handle and connected with the ratchet wheel, said head being provided with a receiving socket, a projection and segmental slots, a chuck adapted to fit within said socket and having a groove to receive said projection, and a pair of angular locking recesses, a rotary locking member on the head provided with lugs movable in said slots and adapted to engage said locking recesses, and a locking device having an adjustable locking connection with the head to resist turning movement of said locking member.

2. A wrench comprising a handle, a ratchet wheel carried thereby, spring actuated dogs to engage the ratchet wheel, means for throwing either dog into and out of operation, a head mounted to rotate upon the handle and connected with the ratchet wheel, said head being provided with a receiving socket, a projection and segmental slots, a chuck adapted to fit within said socket and having a groove to receive said projection and a pair of angular locking recesses, a rotary locking member on the head provided with lugs movable in said slots and adapted to engage said locking recesses, and a spring locking member on the head to resist turning movement of said locking member.

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

AMBUS M. FULKERSON.

Witnesses:

BESS McCLELLAN,
W. C. KOHLENBERG.