

No. 751,964.

PATENTED FEB. 9, 1904.

C. P. WING.  
TIRE BOLT WRENCH.

APPLICATION FILED MAY 26, 1903.

NO MODEL.

Fig. 1.

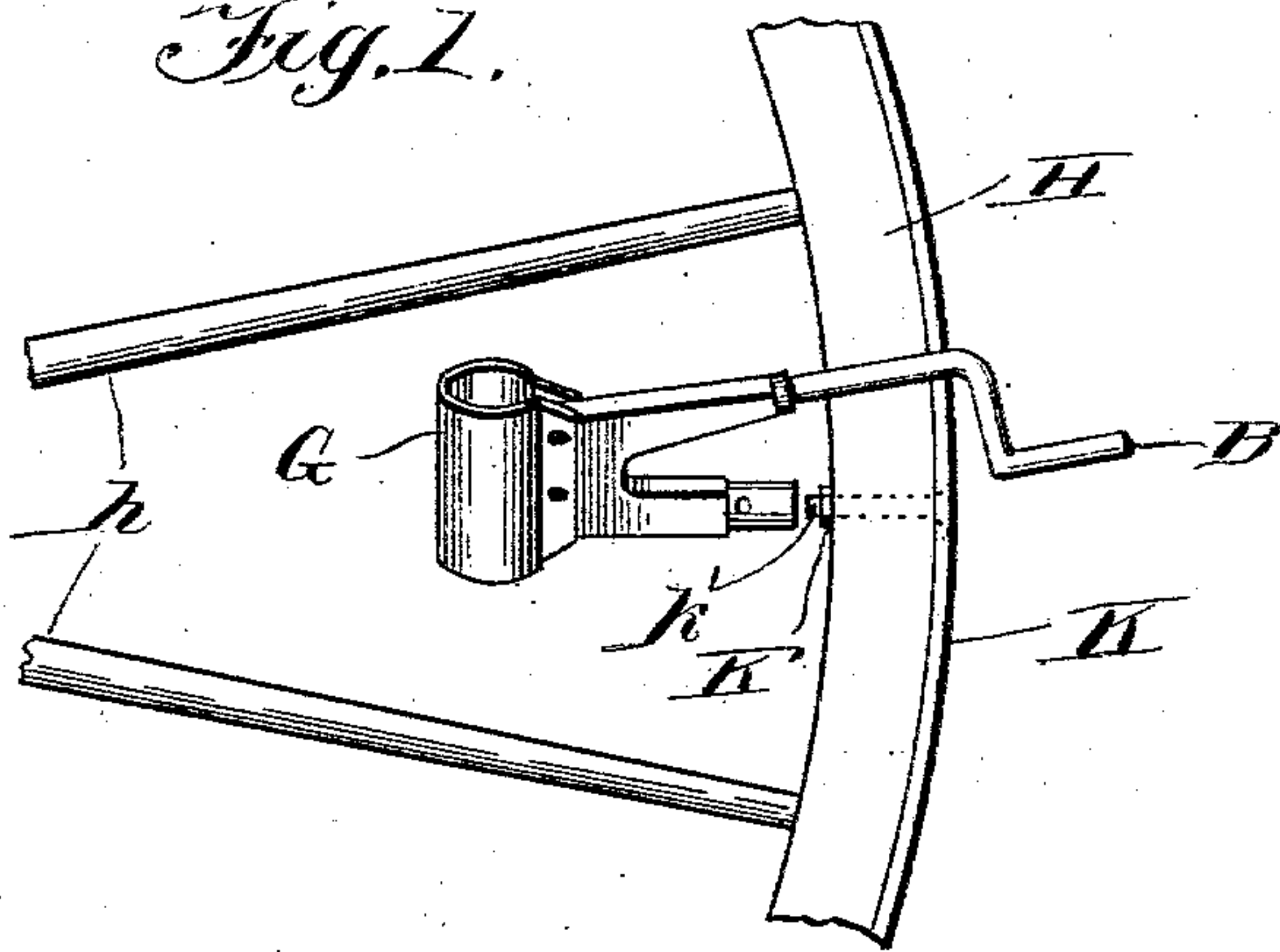


Fig. 2.

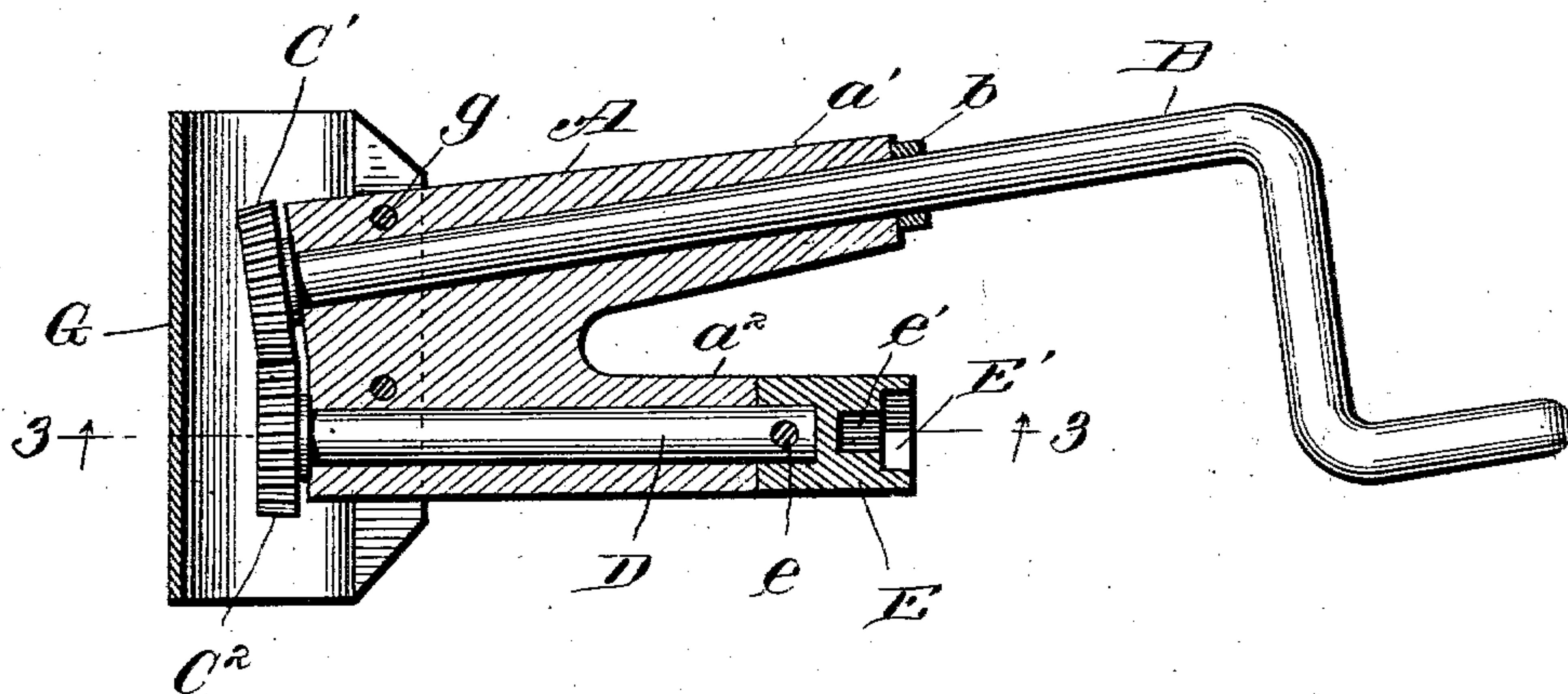
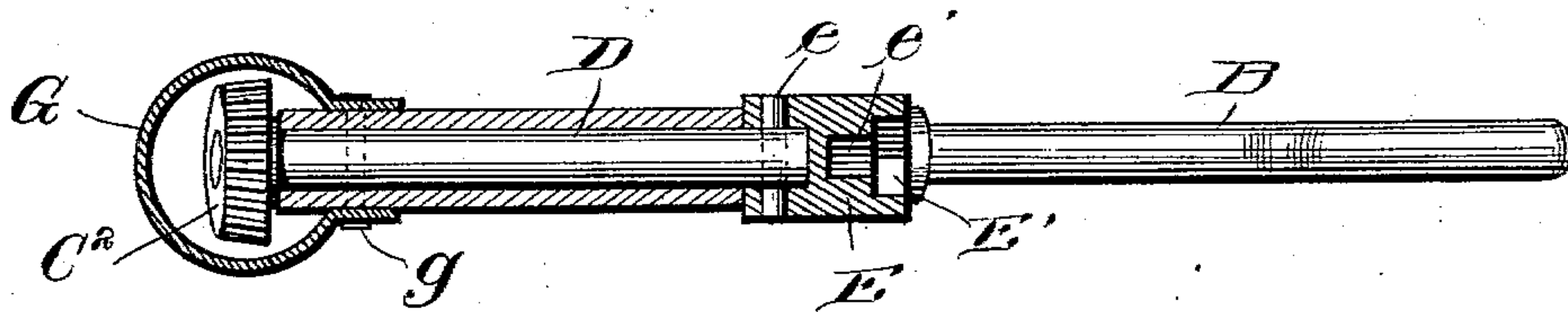


Fig. 3.



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## TIRE-BOLT WRENCH.

SPECIFICATION forming part of Letters Patent No. 751,964, dated February 9, 1904.

Application filed May 26, 1903. Serial No. 158,803. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES P. WING, a citizen of the United States, residing at Hinsdale, county of Dupage, State of Illinois, have invented a certain new and useful Improvement in Tire-Bolt Wrenches; and I 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates in general to wrenches, and more particularly to tire-bolt wrenches.

It is customary to secure the tire to the felly of a wheel by means of bolts, the heads of which are flush with the outer surface of the tire, while to their screw-threaded ends, which project beyond the inner surface of the felly, are secured nuts. The spokes of the wheel render it difficult to secure the nuts upon the bolts by the use of ordinary wrenches, and consequently various forms of wrenches have been devised especially for the purpose of affixing nuts to tire-bolts. In some of such previously-constructed wrenches the handles are adapted to rest on the wheel-spokes to steady the device while in operation. In others shafts connected at right angle have been employed, while in others it has been necessary to use bit-braces. These prior devices have, however, proven inefficient and unsatisfactory in use.

The primary object of my invention is to provide a tire-bolt wrench which may be firmly held in position upon the nut of the bolts by pressure exerted toward the user without obstructing a view of the work and which may be conveniently and easily operated.

A further object of my invention is to provide a tire-bolt wrench which will be simple in construction, inexpensive in manufacture, and efficient in use.

My invention, generally described, consists in a crank-shaft, a second shaft located in an inclined position relatively to the crank-shaft, meshed bevel-gears fixed upon the converging ends of the two shafts, a block fixed to the free end of the second shaft having a socket to non-rotatively surround the nut, a

supporting-frame in which the shafts are journaled, and a shield, which serves as a handle, fixed upon the supporting-frame and surrounding the gears.

My invention will be more fully described hereinafter with reference to the accompanying drawings, in which the same is illustrated as embodied in a convenient and practical form, and in which—

Figure 1 is a plan view of my invention in operative position with relation to a portion of a wheel; Fig. 2, a central sectional view, the shafts and gears thereon being shown in plan; and Fig. 3, a sectional view on line 3 3, Fig. 2, looking upwardly.

The same reference characters are used to indicate the same parts in the several figures of the drawings.

A indicates a supporting-frame, in which are journaled relatively inclined shafts B and D. The supporting-frame may be bifurcated, as shown, so as to provide extending bearing-surfaces  $a'$   $a''$  for the shafts.

The shaft B is provided with means for imparting rotary motion thereto—such, for instance, as a crank. The end of the shaft B opposite to that on which the crank is formed is provided with a bevel-gear  $C'$ , which meshes with the bevel-gear  $C''$ , fixed upon the corresponding end of the shaft D. It is obvious that any suitable means other than meshed gear-wheels may be provided for rotatively connecting the converging ends of the two shafts. The shaft B is held longitudinally immovable with respect to the frame A by means of a collar  $b$ , fixed thereon, which engages the end of the bearing  $a'$ . The end of the shaft D which projects beyond the bearing  $a''$  thereon is provided with a block E. This block may be rigidly secured to the end of the shaft D by any suitable means—such, for instance, as a cotter-pin  $e$ . A recess  $E'$  is provided in the outer face of the block E, the cross-section of such recess conforming to the contour of the nut which is to be affixed to the tire-bolt. A recess  $e'$  extends inwardly within the block E to receive the end of the bolt.

A shield G, preferably formed of sheet metal, surrounds the meshed gear-wheels  $C'$  and  $C''$  and is secured to the opposite sides of



the supporting-frame A by any suitable fastening devices—such, for instance, as rivets *g*. The shield G extends at right angle to the shaft D for a purpose subsequently to be described.

5 In order to better illustrate the operation of my invention, I have disclosed the same in Fig. 1 in connection with a portion of a wheel. H indicates the felly of a wheel, and K the tire surrounding the same. *k'* indicates the tire-bolt, the head of which is flush with the outer surface of the tire. K' indicates a nut screwed upon the end of the bolt *k'*, and to affix such nut to the bolt is the design of my invention. *h, h* indicate spokes of the wheel, which extend

15 from the felly H to the hub, which is not shown. The operation of my invention is as follows: The wheel is preferably placed in a horizontal position after the tire has been placed around the felly. The bolts are then passed through 20 the tire and felly preparatory to having the nuts screwed thereon. A nut is placed within the recess E' in the block E and then held against the screw-threaded end of the bolt while the crank is being rotated in the direction usual for engaging a nut upon a bolt. 25 The operator by grasping the shield G with his left hand exerts a pressure toward his body at the same time that he rotates the crank-shaft with his right hand. As the shield G occupies a position at right angle to the shaft 30 D, a direct pressure may be communicated from the shield G to the nut through the shaft D and supporting-frame A. The inclination of the shafts is such that neither the bearing 35 *a'* of the crank-shaft nor the crank-shaft itself interferes with a view of the work.

From the foregoing description it will be observed that I have invented an improved tire-bolt wrench which though comprising a 40 few parts is so constructed as to render it possible to readily apply a nut to a tire-bolt and without interfering with the user inspecting the work during the operation of the device.

While I have described more or less precisely the details of construction, I do not 45 wish to be understood as limiting myself thereto, as I contemplate changes in form, the proportion of parts, and the substitution of equivalents as circumstances may suggest or render expedient without departing from the 50 spirit of my invention.

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

1. In a tire-bolt wrench, the combination 55 with a supporting-frame, of a shaft journaled in said supporting-frame, means for rotating said shaft, a second shaft also journaled in said frame, meshed gear-wheels fixed upon corresponding ends of said shafts, means upon 60 said second shaft adapted to non-rotatively engage a nut, and a shield surrounding said gear-wheels and fixed upon the supporting-frame, said shield serving as a handle upon which pressure toward the user is exerted for retain- 65 ing the wrench in operative position.

2. In a tire-bolt wrench, the combination with a supporting-frame, of a crank-shaft journaled in said supporting-frame, a second shaft also journaled in said frame in an inclined position relatively to the crank-shaft, 70 meshed gear-wheels fixed upon the converging ends of said shafts which project beyond the supporting-frame, means fixed upon the second shaft to non-rotatively engage a nut, 75 and a sheet-metal shield surrounding the gear-wheels and fixed upon the supporting-frame, said shield serving as a handle upon which pressure toward the user is exerted for retaining the wrench in operative position. 80

In testimony whereof I sign this specification in the presence of two witnesses.

CHARLES P. WING.

Witnesses:

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