

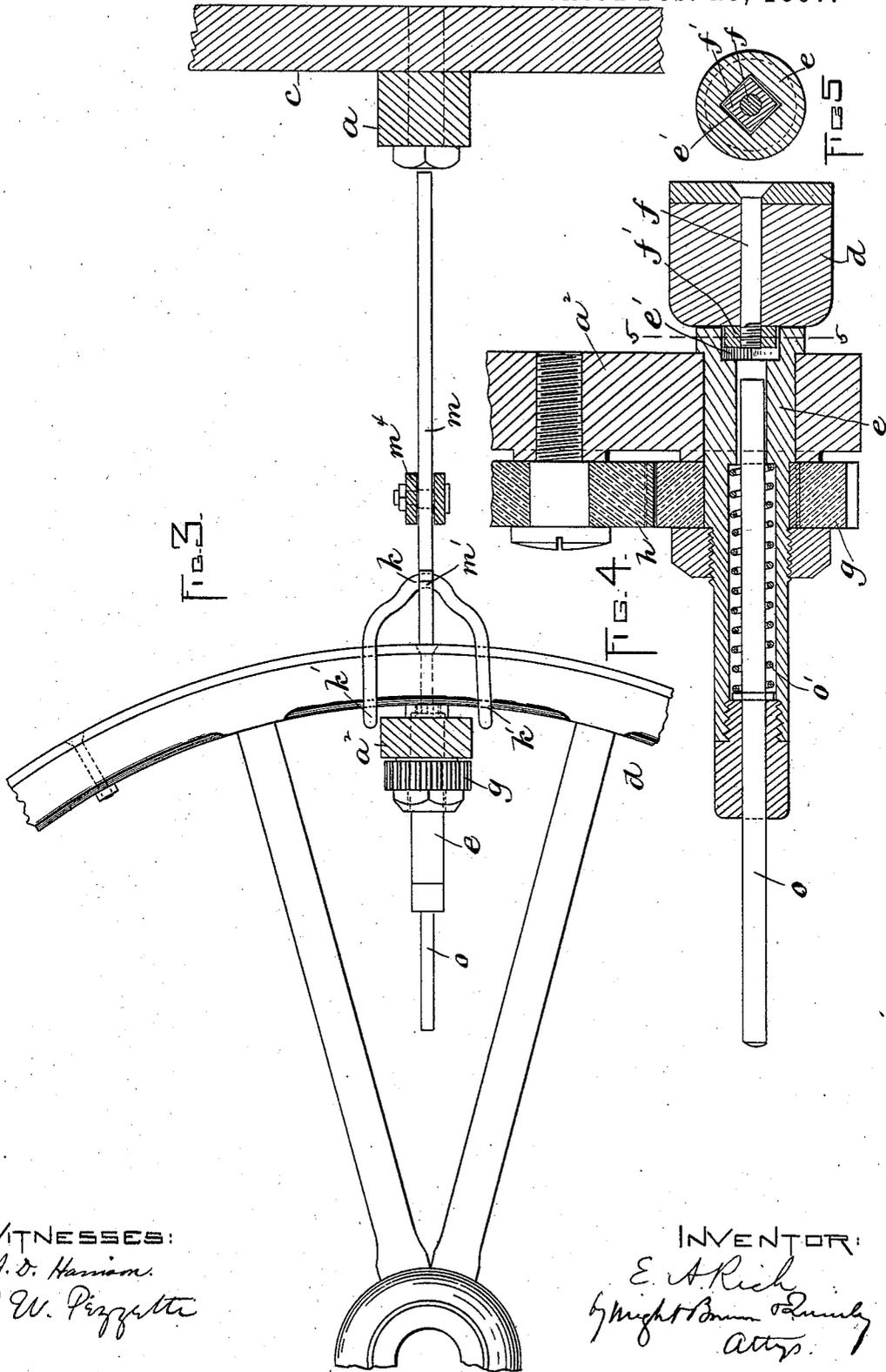
(No Model.)

2 Sheets—Sheet 2.

E. A. RICH.
TIRE BOLT WRENCH.

No. 577,451.

Patented Feb. 23, 1897.



WITNESSES:
A. D. Harrison
P. W. Perzette

INVENTOR:
E. A. Rich
Wright & Brown
Atty.

UNITED STATES PATENT OFFICE.

ETHAN A. RICH, OF SCITUATE, MASSACHUSETTS.

TIRE-BOLT WRENCH.

SPECIFICATION forming part of Letters Patent No. 577,451, dated February 23, 1897.

Application filed July 9, 1896. Serial No. 598,553. (No model.)

To all whom it may concern:

Be it known that I, ETHAN A. RICH, of Scituate, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Tire-Bolt Wrenches, of which the following is a specification.

This invention relates to means for turning on and off nuts on the bolts that secure tires to the felloes of carriage and wagon wheels. These nuts are located on the inner surfaces of the felloes between the spokes, the space for the movement of a wrench applied to the nuts being limited by the spokes, so that when an ordinary wrench is used repeated applications and removals of the wrench are required in applying and removing each nut, a considerable loss of time being involved.

My invention has for its object to provide means for rapidly turning said nuts without requiring the removal of the wrench during the operation; and to this end it consists in the improvements which I shall proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of my improved wrench. Fig. 2 represents an end view of the same. Fig. 3 represents a section on line 3 3, Fig. 1. Fig. 4 represents a section on line 4 4, Fig. 2. Fig. 5 represents a section on line 5 5, Fig. 4.

The same letters of reference indicate the same parts in all the figures.

In carrying out my invention I provide an arm or frame comprising an inner vertical portion *a*, having holes to receive bolts or lag-screws *b b*, whereby the arm may be rigidly attached to a wall *c* or other vertical support, a horizontal portion *a'*, and an outer vertical portion *a²*, the parts *a'* and *a²* overhanging a space at one side of the wall *c*. The frame thus supported may stand slightly above a bench or other support, on which rests horizontally a wheel *d*, whose hub is at the outer side, while its rim is at the inner side, of the vertical portion *a²*, as shown in Fig. 3, the rim being slightly above the lower end of the portion *a²*, as shown in Figs. 1, 2, and 4.

e represents a spindle which is journaled horizontally in the lower end of the portion *a²*, and has at its inner end a socket *e'*, formed

to engage a nut *f'* on the inner end of a tire-securing bolt *f*, said spindle constituting a wrench.

To the spindle *e* is affixed a gear *g*, with which meshes an intermediate gear *h*, meshing in turn with a larger gear *i*, which is mounted to rotate on a stud *i'*, affixed to the portion *a²*. The gear *i* is provided with a crank *i²*, whereby it may be rotated, its rotation imparting rotary movement to the wrench through the intermediate gear *h*, the latter causing the wrench to rotate in the same direction as the gear *i*.

It will be seen that the overhanging arm and the wrench carried thereby are adapted to enter the space between two spokes of a wheel and engage a tire-bolt nut, and that the mechanism for rotating the wrench is located wholly outside of said space, so that the wrench can be conveniently and continuously rotated in either direction, and thus quickly applied and removed. In practice the wheel will be supported horizontally on a bench or support and partially rotated after each nut has been applied or removed to bring the next nut into position, suitable provision being made for tapping or depressing the wheel-rim to prevent the spokes to pass under the portion *a²* when the wheel is being adjusted. To prevent the bolt *f* from turning with the nut *f'*, I provide a vise or clamp consisting of a fulcrum-arm *k*, having hooks *k' k'*, formed to engage the inner side of the wheel-rim, and a lever *m*, having a fulcrum hook or projection *m'*, formed to engage the arm *k*. The lever *m* is formed at *m²* to bear on the head of a bolt *f*, and when the opposite end of the lever is depressed the end *m²* is caused to press on the bolt-head so firmly as to prevent it from turning. The lever *m* is preferably suspended from the frame by a spring *m³*, having a block *m⁴*, to which the lever is pivoted at *m⁵*.

The wrench is provided with a plunger or ejector *o*, which is movable endwise in the wrench for the purpose of ejecting a nut therefrom after its removal from a bolt. The ejector is normally retracted by a spring *o'*.

I do not limit myself to the details of construction here shown and described and may

variously modify the same without departing from the spirit and scope of my invention.

The appliance may be adapted for other analogous operations, such as boring and
5 countersinking the holes that receive the bolts *f*, in which case the spindle *e*, instead of being constructed as a wrench, may be constructed to hold a boring or countersinking tool.

10 I claim—

1. An appliance of the character specified, comprising an arm or frame having means for attachment to a vertical support, the said
15 frame being formed to overhang a space at one side of said support, a wrench-spindle journaled in the overhanging portion of said arm and formed to engage a nut on the inner surface of a wheel-rim projecting into said space, and means for rotating said wrench.

2. An appliance of the character specified, comprising an arm or frame having means for attachment to a vertical support, the said
20 frame being formed to overhang a space at one side of said support, a wrench-spindle journaled in the overhanging portion of said arm and formed to engage a nut on the inner surface of a wheel-rim projecting into said space, a gear rotatively mounted in said arm, a gear affixed to the wrench, and an intermediate gear connecting the two gears.

3. An appliance of the character specified, comprising an arm or frame having means for attachment to a vertical support, the said
35 frame being formed to overhang a space at one side of said support, a wrench-spindle journaled in the overhanging portion of said arm and formed to engage a nut on the inner surface of a wheel-rim projecting into said space, means for rotating said wrench,
40 and a plunger or ejector movable endwise in the wrench.

4. An appliance of the character specified, comprising an arm or frame having means for attachment to a vertical support, the said
45 frame being formed to overhang a space at one side of said support, a wrench-spindle journaled in the overhanging portion of said arm and formed to engage a nut on the inner surface of a wheel-rim projecting into
50 said space, means for rotating said wrench,

and a vise or clamp arranged to hold a tire-bolt on the wheel, and prevent the same from turning.

5. An appliance of the character specified, comprising an arm or frame having means
55 for attachment to a vertical support, the said frame being formed to overhang a space at one side of said support, a wrench-spindle journaled in the overhanging portion of said arm and formed to engage a nut on the inner surface of a wheel-rim projecting into
60 said space, means for rotating said wrench, a fulcrum-arm formed to detachably engage the inner side of the wheel-rim, and a lever fulcrumed on said arm and formed to en-
65 gage the head of a tire-bolt on the outer side of the wheel-rim.

6. An appliance of the character specified, comprising an arm or frame having means for attachment to a vertical support, the said
70 frame being formed to overhang a space at one side of said support, a wrench-spindle journaled in the overhanging portion of said arm and formed to engage a nut on the inner surface of a wheel-rim projecting into
75 said space, means for rotating said wrench, a suspension-spring secured to said arm, a lever pivotally connected to said spring, and provided with a fulcrum hook or projection, and a fulcrum-arm formed to engage
80 said hook and provided with hooked fingers formed to bear on the inner side of a wheel-rim.

7. An appliance of the character specified, comprising an arm or frame having means
85 for attachment to a vertical support, the said frame being formed to overhang a space at one side of said support, a spindle journaled in the overhanging portion of said arm, and means supported by the arm for rotating
90 said spindle.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 6th day of July, A. D. 1896.

ETHAN A. RICH.

Witnesses:

A. D. HARRISON,
P. W. PEZZETTI.