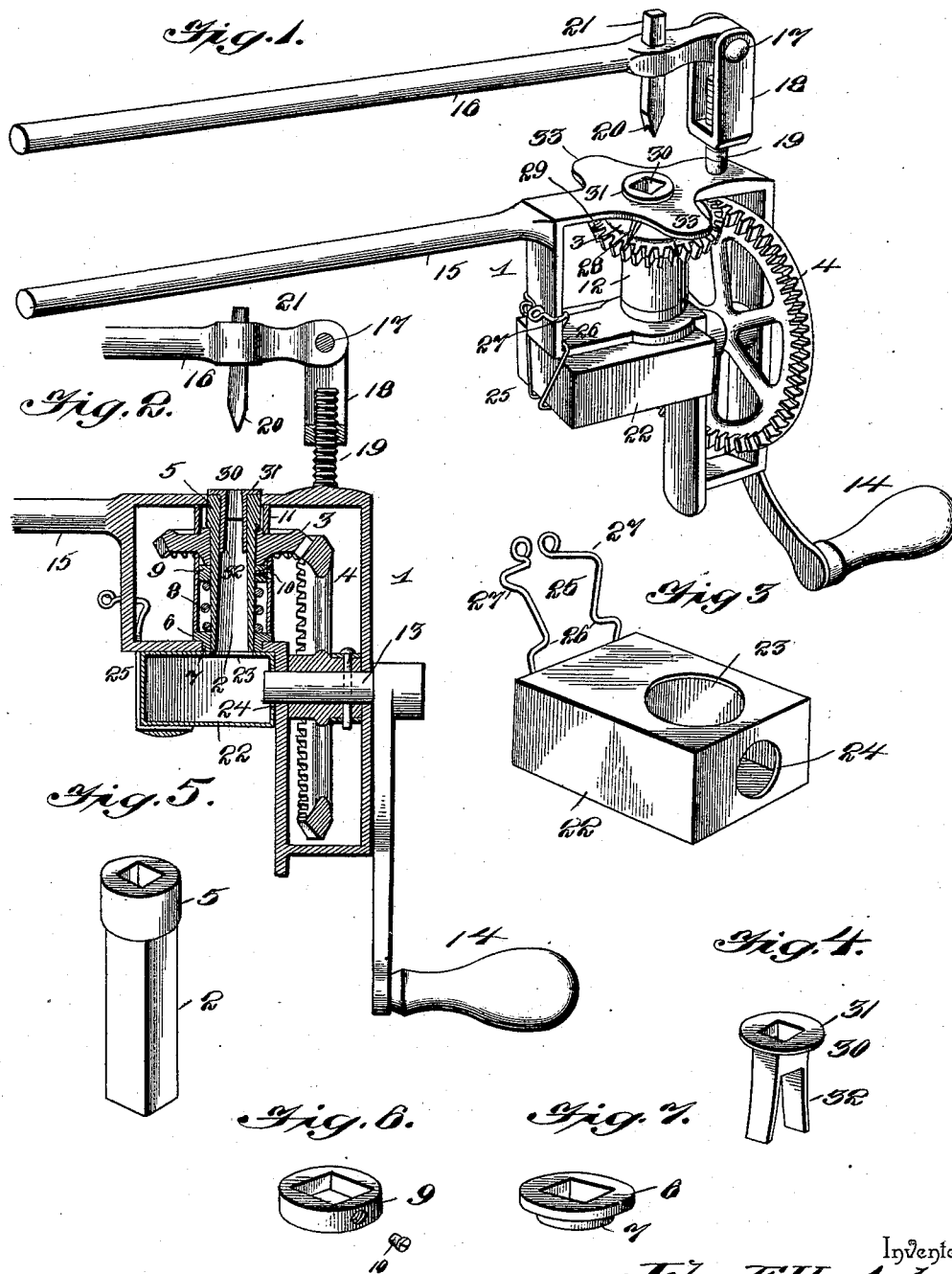


(No Model.)

J. F. HERTZLER & F. ROGERS.
DEVICE FOR REMOVING TIRE BOLTS.

No. 578,636.

Patented Mar. 9, 1897.



Witnesses
W. Koeth.
H. F. Riley

Inventors
John F. Hertzler
Frank Rogers,
By their Attorneys,
C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

JOHN F. HERTZLER AND FRANK ROGERS, OF LAWRENCE, KANSAS; SAID
ROGERS ASSIGNOR TO SAID HERTZLER.

DEVICE FOR REMOVING TIRE-BOLTS.

SPECIFICATION forming part of Letters Patent No. 578,636, dated March 9, 1897.

Application filed June 10, 1896. Serial No. 595,049. (No model.)

To all whom it may concern:

Be it known that we, JOHN F. HERTZLER and FRANK ROGERS, citizens of the United States, residing at Lawrence, in the county of Douglas and State of Kansas, have invented a new and useful Device for Removing Tire-Bolts, of which the following is a specification.

The invention relates to improvements in devices for removing tire-bolts.

10 The object of the present invention is to provide a simple, inexpensive, and efficient device capable of rapidly removing tire-bolts from a wheel and of enabling the nuts of the same to be readily screwed on.

15 A further object of the invention is to provide means for receiving and holding the nuts as they are removed from a wheel, so that the device may be rapidly transferred from one tire-bolt to another without stopping to collect nuts by hand.

Another object of the invention is to enable the device to be readily adjusted to suit the size of a wheel and the position of the tire-bolts thereon.

25 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.

30 In the drawings, Figure 1 is a perspective view of a device for removing tire-bolts constructed in accordance with this invention. Fig. 2 is a longitudinal sectional view. Fig. 3 is a detail perspective view of the nut box or receptacle. Fig. 4 is a detail perspective view of the removable nut-socket. Fig. 5 is a similar view of the nut-engaging spindle. Fig. 6 is a similar view of the adjustable collar. Fig. 7 is a detail perspective view of the lower bearing-plate of the nut-engaging spindle.

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

45 1 designates a bearing-frame substantially L-shaped in side elevation and consisting of a rectangular upper portion and a lower oblong portion depending from one end of the rectangular upper portion. The rectangular upper portion of the bearing-frame, which is constructed of suitable metal, is provided at

its top and bottom with bearing-openings for a nut-engaging spindle 2, which carries a horizontal pinion 3, and which is operated by a vertical gear-wheel 4, mounted in the oblong portion of the frame. The nut-engaging spindle 2, which has a rectangular bore extending entirely through it, is provided at its top with a rounded portion 5, and the body portion of it is squared.

60 The pinion 3 is provided with a rectangular opening, and it is detachably arranged on the squared portion of the nut-engaging spindle, and it fits at its upper face against the shoulder formed by the rounded portion 5, which is of greater diameter than the polygonal or squared body portion. The lower end of the spindle 2 is arranged in a rectangular opening of a bearing-plate 6, located on the upper face of the bottom of the rectangular upper portion of the frame 1 and provided with a hub or journal 7, fitting in the adjacent bearing-opening of the frame.

75 The spindle is yieldingly supported by a spiral spring 8, which is interposed between the bearing-plate 6 and an adjustable collar 9, and the latter, which is provided with a rectangular opening to conform to the configuration of the spindle, is secured at any desired adjustment by a clamping-screw 10, mounted in a threaded portion of the collar and engaging the adjacent face of the spindle. By supporting the spindle in this manner the operation of the device is greatly facilitated and is rendered easy.

85 An upper sleeve 11 is interposed between the pinion 3 and the top of the rectangular portion of the frame and is arranged on the rounded portion of the spindle. The adjustable collar and the spring are concealed within a lower sleeve 12, loosely arranged between the pinion and the bearing-plate 6 and provided with an opening adapted to be brought opposite the clamping-screw 10 to enable the spindle to be readily released from the adjustable collar. The spindle is adapted to be readily drawn outward, and the other parts may then be removed, and in assembling the parts the bearing-plate is mounted on the frame, the spring and the collar are placed in the sleeve, and the pinion and the upper sleeve are then arranged on top of the

lower sleeve. The parts thus assembled may be readily inserted in the upper portion of the frame 1. The various openings of the pinion-collar and bearing-sleeve are made to register, and the spindle is then inserted and secured in place by the clamping-screw.

The gearing is preferably beveled, and the gear-wheel 4 is keyed or otherwise fixed to a horizontal shaft 13, which projects from the sides of the depending oblong portion of the frame 1, and a crank-handle 14 is fixed to the outer end of the shaft 13, and the crank-handle 14 for operating the device is secured to the outer end of the shaft 13.

A longitudinally-disposed bar or rod 15 is secured to the frame 1 at the top thereof, and a lever 16 is adjustably fulcrumed on the supporting-frame and is adapted to cooperate with the bar 15 to enable the device to clamp the rim of a wheel, which is arranged between the top of the frame and the lever 16, adjacent to the pivoted end of the latter.

The lever 16 is pivoted by means of a bolt 17 or other suitable fastening device in a rectangular frame or yoke 18 at the top thereof, and the frame or yoke 18 is provided at its bottom with a threaded opening and is arranged on a screw 19 and is adapted to be rotated to raise and lower the pivotal end of the lever. The screw 19, which is disposed vertically, is fixed to the top of the frame and is located above the gear-wheel 4.

In removing a tire-bolt the frame is placed beneath the felly with the spindle in position to receive the nut, and the head of the bolt is engaged by a chisel edge 20 of a shank 21, which is mounted in an opening or socket of the lever adjacent to the pivoted or fulcrumed end thereof. The shank and the socket or opening are tapered, and the former, which is readily removable, has its engaging edge slightly concave to provide a pair of points for biting the head of the nut. By this construction the bolt is held firmly stationary while the spindle is being rotated to screw or unscrew a nut, and as the yoke or frame 18 and the screw 19 form an adjustable support for the lever the latter may be raised or lowered or swung at an angle to accommodate the device to a wheel and to position the parts to suit the position of the tire-bolts.

As the bore of the spindle extends entirely through it a nut is permitted to fall through the spindle, and it is received within a removable box 22, arranged beneath the upper portion of the frame and provided at its top with an opening 23, located beneath the spindle. The inner end of the box is provided with an opening 24 to engage the inner end of the shaft 13, and a spring-catch 25 is mounted on the box at the outer end thereof and comprises a pair of resilient jaws for engaging the adjacent portion of the frame 1. The jaws extend upward from the box and are provided with inwardly-extending bends 26 to engage the inner face of the adjacent

vertical portion of the frame 1, and they have horizontal arms 27 at their tops to engage the side edges of the vertical portion of the frame. The terminals of the jaws, which are constructed of wire, are provided with loops forming finger-pieces to enable the catch to be readily manipulated.

The fall of the nut into the box will indicate to the operator that it is removed from the bolt, and the device may be rapidly transferred from one tire-bolt to another without stopping to collect nuts by hand, and after all the nuts of the rim of the wheel have been removed they may be emptied from the box.

The frame is provided with a projection 28, and the pinion is provided with marks 29 to indicate the position of the spindle, in order that the operator, when screwing on nuts, may tell when the sides of the latter are arranged parallel with the sides of the rim of the wheel.

In order to adapt the spindle to receive nuts of a similar size a removable socket 30 is employed. The socket 30 fits into the upper end of the spindle, and it is provided at its outer end with a head or flange 31, and has at its inner end resilient extensions or arms 32, adapted to engage the interior of the spindle.

The frame is provided, at opposite sides of the engaging end of the spindle, with lateral extensions 33, forming a broad bearing or surface for engaging the felly of the wheel to avoid scratching or otherwise marring the same.

It will be seen that the device is simple and comparatively inexpensive in construction, that it is positive and reliable in operation, and that it is capable of enabling tire-bolts to be readily and rapidly removed.

It will also be seen that it is capable of firmly engaging the head of a tire-bolt, and that it may be readily adjusted to accommodate itself to the size of the rim of a wheel and to the position of the tire-bolts thereon.

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

What we claim is—

1. In a device of the class described, the combination of a frame, a nut-engaging spindle journaled thereon, a screw fixed to the frame and extending upward therefrom, a yoke or frame having a threaded opening and adjustably mounted on the screw, and a lever fulcrumed in the yoke or frame, arranged to clamp the rim of the wheel between it and the frame, and provided with means for engaging the head of a bolt, substantially as described.

2. In a device of the class described, the combination of a frame, a bar extending longitudinally therefrom and forming a handle, a screw fixed to the frame and extend-

ing upward from the top of the same, a yoke having a threaded opening and adjustably mounted on the screw, a lever fulcrumed on the yoke and provided with means for engaging the head of a bolt, a vertically-disposed spindle journaled in the frame, a pinion mounted on the spindle, and a gear-wheel meshing with the pinion, substantially as described.

3. In a device of the class described, the combination of a frame, a vertically-disposed spindle journaled therein and provided with a nut opening or bore extending entirely through it, a gearing for rotating the spindle, a box arranged beneath the spindle and provided at its top with an opening and detachably interlocked with the frame at one end, and a spring-catch mounted on the box at the other end thereof and detachably engaging the frame, substantially as described.

4. In a device of the class described, the combination of a frame provided with a substantially rectangular upper portion, and a depending oblong portion, a vertical spindle journaled in the upper portion of the frame and having a nut-receiving opening extending entirely through it, a pinion mounted on the spindle, a shaft journaled on the lower portion of the frame and projecting from the inner side thereof, a gear-wheel fixed to the shaft and meshing with the pinion, a box mounted beneath the spindle and provided, at its inner end, with an opening receiving the adjacent end of said shaft, and a spring-catch mounted on the other end of the box and comprising a pair of jaws provided with inwardly-extending bends to engage the upper portion of the frame, and arms embracing the opposite edges of the frame, substantially as described.

5. In a device of the class described, the combination of a frame provided with upper and lower bearing-openings, a polygonal spindle having a rounded upper end arranged in

the upper bearing-opening, a bearing-plate having a journal or head fitting in the lower bearing-opening, said bearing-plate being provided with an opening to receive the lower end of the spindle, an adjustable collar mounted on the spindle, a spiral spring interposed between the bearing-plate and collar, a pinion mounted on the spindle and located above the adjustable collar, a sleeve concealing the adjustable collar and the spring, and a gear-wheel meshing with the pinion, substantially as described.

6. In a device of the class described, the combination of a frame, a nut-engaging spindle journaled thereon, a lever connected with the frame and provided with means for engaging the head, gearing for rotating the spindle, and a removable socket fitting within the spindle, adapted to enable the nut-receiving opening to be varied in size to operate on different nuts, and provided with a horizontal flange extending from the engaging end of the spindle, said removable socket being provided with resilient longitudinally-disposed arms frictionally engaging the inner face of the spindle, substantially as described.

7. In a device of the class described, the combination of a frame provided with a projection, a spindle journaled on the frame and having a nut-engaging opening, a pinion mounted on the spindle, arranged adjacent to the said projection and provided with marks adapted to register with the projections to indicate the position of the spindle, and a gear-wheel meshing with the pinion, substantially as described.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

JOHN F. HERTZLER.
FRANK ROGERS.

Witnesses:

ELI RIDLEY,
JOHN C. STEARNS.