No. 710,240. Patented Sept. 30, 1902.

W. BELFIELD, R. SHEARER, J. FINDLAY & G. BELFIELD.

LOCK NUT FOR VEHICLE AXLES.

(Application filed Feb. 24, 1902.)

(No Model.)

Fig. 1.

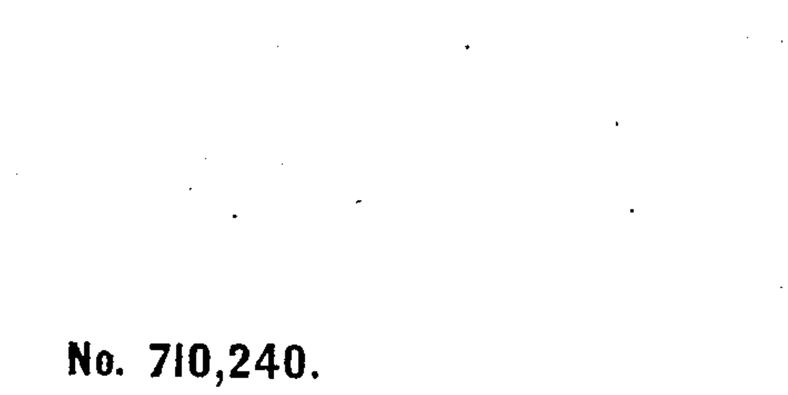


Fig. 2.

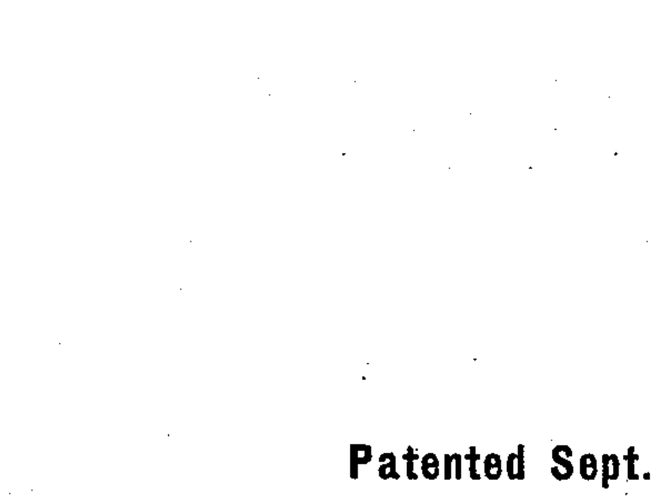


Fig. 3.

Fig. 4.

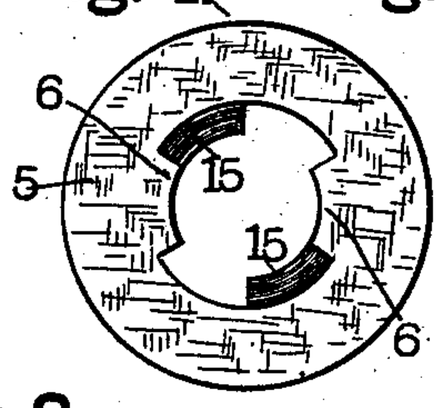


Fig. 5.

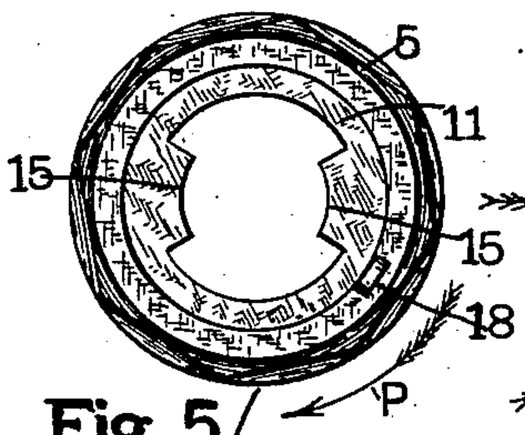


Fig. 6.

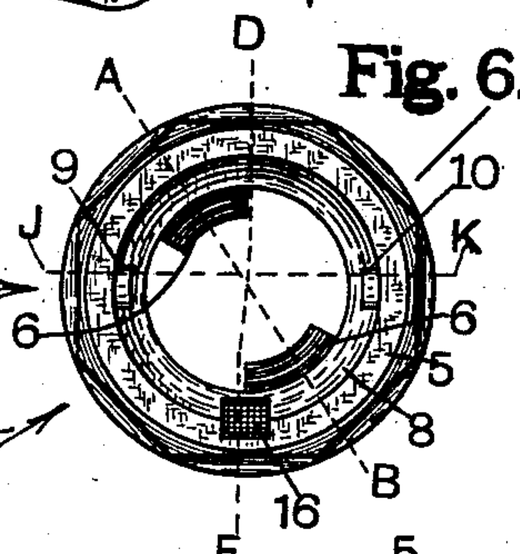


Fig. 13.

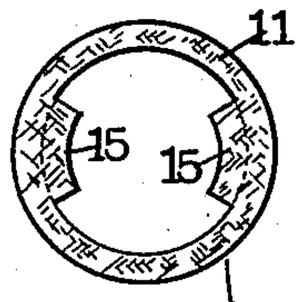


Fig. 12.

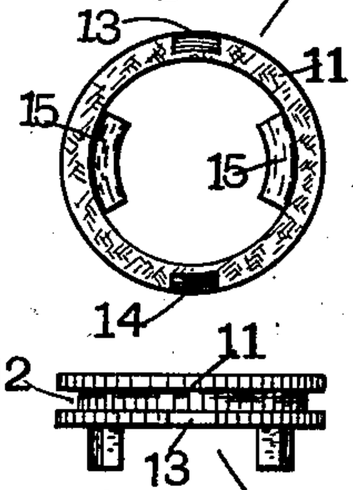


Fig. 14.

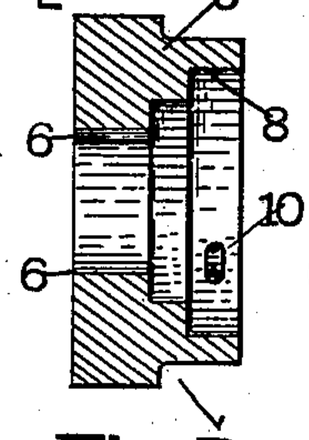


Fig. 7.

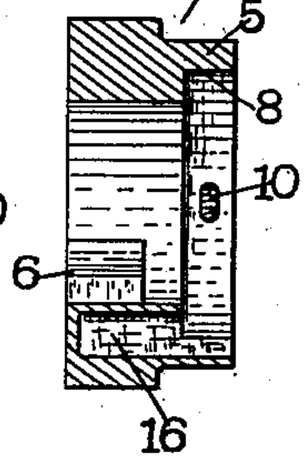


Fig. 8.

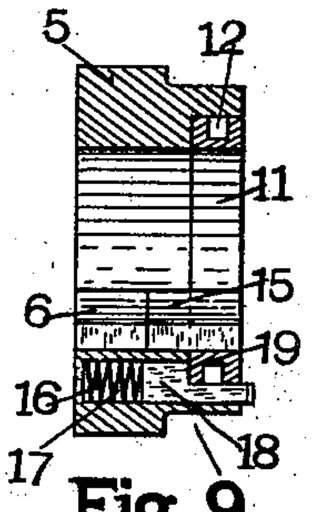


Fig. 9.

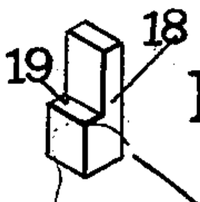
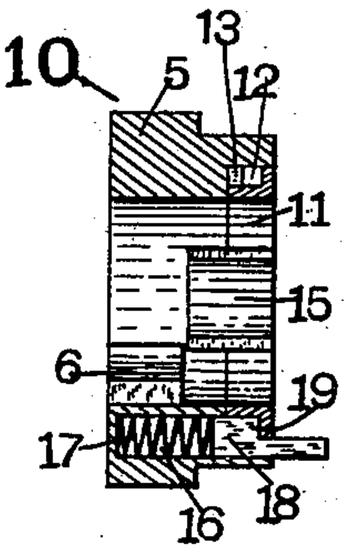


Fig. 15.

Fig. 10



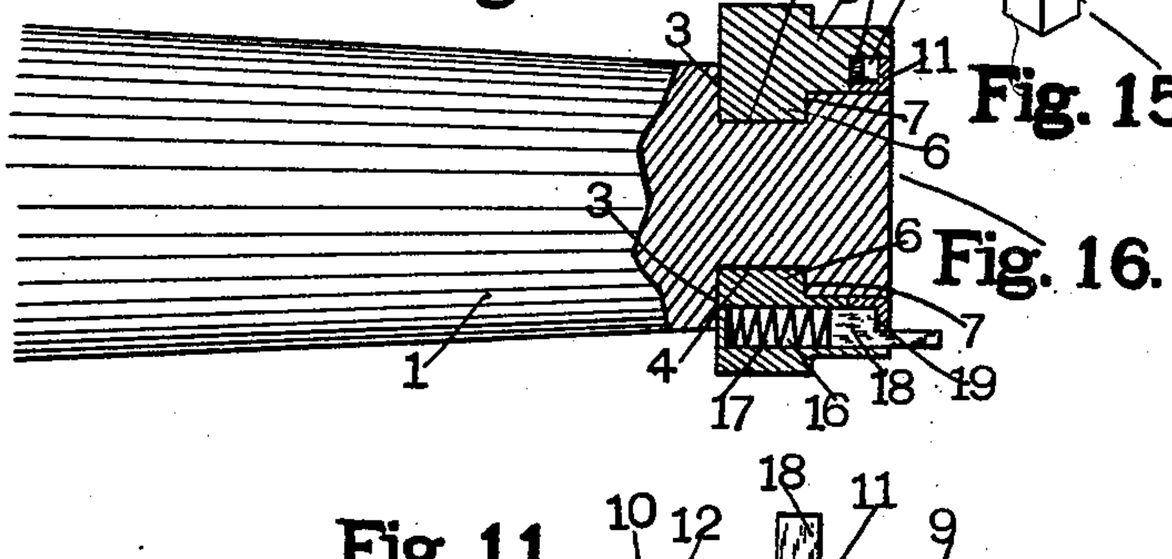
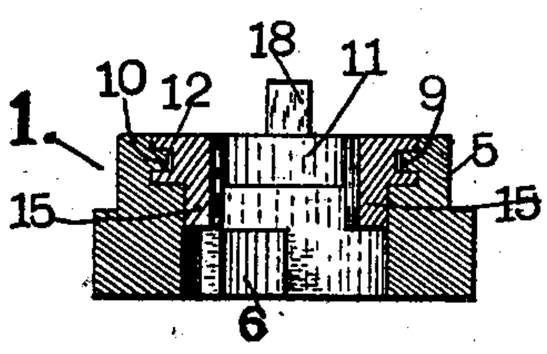


Fig. 16.

Fig. 11.



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John Findlay

BY Gamaliel Belfield

Oscar Snell

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UNITED STATES PATENT OFFICE.

WILLIAM BELFIELD, ROBERT SHEARER, JOHN FINDLAY, AND GAMALIEL BELFIELD, OF MINOOKA, ILLINOIS, ASSIGNORS OF ONE-FIFTH TO GEORGE GLEASON, OF MINOOKA, ILLINOIS.

LOCK-NUT FOR VEHICLE-AXLES.

SPECIFICATION forming part of Letters Patent No. 710,240, dated September 30, 1902.

Application filed February 24, 1902. Serial No 95,371. (No model.)

To all whom it may concern.

Be it known that we, WILLIAM BELFIELD, ROBERT SHEARER, JOHN FINDLAY, and GAMALIEL BELFIELD, citizens of the United States, residing at Minooka, in the county of Grundy and State of Illinois, have invented a new and useful Lock-Nut for Vehicle-Axles, of which the following is a specification.

Our invention relates to lock-nuts for vehicle-axles, but may be used to lock the nuts of bolts or rods which serve a great variety of purposes; and our object is to provide a construction which is adapted to be very quickly operated from the locked or unlocked position, yet serve as a preventive against the accidental removal of the nut and as an improvement in the construction of the lock-nut embodied in Letters Patent of the United States No. 661,255, of November 6, 1900, granted to William Belfield, the same being more particularly described hereinafter and illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the end of an axle-spindle on which at the outer end portion are shown oppositely-disposed side projections adapted to receive the lock-nut hereinafter described. Fig. 2 is a front elevation of the nut with the parts disposed in the same position as they would be if locked on the axle-spindle shown in Fig. 1. Fig. 3 is a side elevation, and Fig. 4 a face elevation, of what is seen in Fig. 2. Fig. 5 is a front elevation showing the unlocked parts as they appear when the nut may be removed from the end of the axle-spindle. Fig. 6 is a front elevation without the locking-ring, bolt, or spring thereof. Fig. 7 is a cross-section on broken line A B, Fig. 6, looking in the direction indicated by arrow C; and Fig. 8 is a cross-section on broken line G H, Fig. 2, looking in the direction indicated by arrow I, to clearly illustrate the hole which serves as a slideway for the locking-bolt and a pocket for the spring therefor. Fig. 9 is the same section of the nut as Fig. 8 with the locking-ring in position and with the locking-bolt and spring in place and in side elevation, the locking-ring being disposed in the open position shown in Fig. 5. Fig. 10 is the same as Fig. 9, but with the locking-ring in the closed and locked position shown in Fig. 2. Fig. 11 is a cross-section of the nut on broken line J K, Figs. 2 and 6, looking in the direction indicated by arrow L, to illustrate manner of holding locking-ring in position within the walls of the nut by means of side lugs which project into a peripheral groove in the ring. Fig. 12 is a front elevation, and Fig. 13 a rear elevation, of the locking-ring, which is shown in edge elevation in Fig. 14, where the peripheral groove and two oppositely-disposed lugs are plainly illustrated. Fig. 15 is a perspective view of the locking-bolt. Fig. 16 is a side elevation of a portion of the outer end of the axle-spindle having the nut mounted thereon and the parts in the locked position; but the end of the spindle, the nut, and locking-ring are broken away to a section on line M N, Fig. 2, looking in the direction indicated by arrow I, the lock-bolt and spring therefor being shown in side elevation.

Similar characters indicate like parts throughout the several views.

In Fig. 1 is shown the outer end portion of an axle-spindle 1, having oppositely-disposed longitudinal grooves 2, and next to the usual shoulder 3 are oppositely-disposed recesses, such as 4, in the sides of the grooves. In the hole through the nut 5 are two inwardly-projecting lugs 6, which are of a size to easily slide along grooves 2 and when the nut is turned in one direction be disposed within the recesses 4 and engage shoulders 7, Figs. 1 and 16, and prevent the nut from being removed in a direction longitudinal of the spindle until it is partially revolved in a direction opposite to that above stated. In the outer end portion of the hole in the nut is an enlarged portion or counterbore 8, having projecting inwardly at usually opposite sides two lugs 9 and 10. The locking-ring 11 is fitted to be disposed within the enlarged portion 8 of the nut and is held by the two lugs 9 and 10, being engaged in an annular groove 12 therein. In register with the positions of the lugs 9 and 10 are two openings 13 and 14, leading into the peripheral groove 12 of the ring, so that to insert or remove the ring from the nut the ring is turned until the lugs and

openings register, when the ring will fall into the counterbore 8 of the nut. It is obvious if the ring is turned the lugs will slide within the peripheral groove and hold the ring in position, yet permit it to freely turn. There are two oppositely-disposed inwardly-projecting lugs 15 in the ring, which are similar to and register with the lugs 6 of the nut when the ring is turned to a certain position, such as shown in Figs. 5 and 9. At one side of the nut is a hole 16, adapted to receive a spring 17 and one end of the lock-bolt 18, which has a shoulder 19, the outer end of the bolt being fitted in a groove in the wall of the counterbore outside of the locking-ring. The portion of the bolt at shoulder 19 is adapted to slide into one of the openings 13 or 14 in the ring by the action of spring 17 and lock the ring in position. If the ring is turned to the position shown in Figs. 5 or 9, so that the lugs 6 of the nut and lugs 15 of the ring are in register, the nut may be slid upon the end of the axle-spindle until in contact with the shoulder thereof at 3, when if the nut is rotated in the direction indicated by arrow P in Fig. 5 the lugs 6 of the nut will slide into the recesses 4 of the spindle, while the locking-ring is held stationary at the end of the spindle until by the turning of the nut the lock-bolt 18 is carried around from the position shown in Fig. 5 to that shown in Fig. 2, when it engages whichever opening 13 or 14 it has been fitted to register with and effectually lock the nut from turning. In removing the nut the outer end of the lock-bolt is pressed inwardly until the locking-ring is disengaged, when the nut may be revolved in a direction the reverse to that indicated by arrow P to the position shown in Fig. 5 and pulled off of the axle-spindle. The outer exposed end portion of the lock-bolt is shown of greater length than is necessary without it is to be operated directly with the fingers. In practice the end of the lock-bolt should be even with or below the outer surface of the nut, for it is intended to operate it by means of a special means with which is combined a wrench, whereby the nut may be handled without contact with the fingers.

We claim as our invention—

In a lock-nut for vehicles, the combination with a vehicle-spindle, the outer end of which is provided with a longitudinally-grooved and laterally-recessed tip, of a nut the inner end of the bore of which is provided with inwardly-projecting lugs adapted to slide within the grooves, and to be moved laterally into the recesses, a ring at the outer end of the nut the inner face of which is provided with inwardly-projecting lugs fitted to slide longitudinally within the grooves of the tip, and means whereby the nut and the ring may be engaged at one relative position and be disengaged at another, for the purpose stated.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILLIAM BELFIELD.
ROBERT SHEARER.
JOHN FINDLAY.
GAMALIEL BELFIELD.

Witnesses:
D. W. SHUFELDT,
GEO. COLLEPS.