No. 745,989. PATENTED DEC. 8, 1903.

W. E. AYRES.

WHEEL SECURING DEVICE.

APPLICATION FILED MAY 8, 1903.

NO MODEL.

Fig. 1.

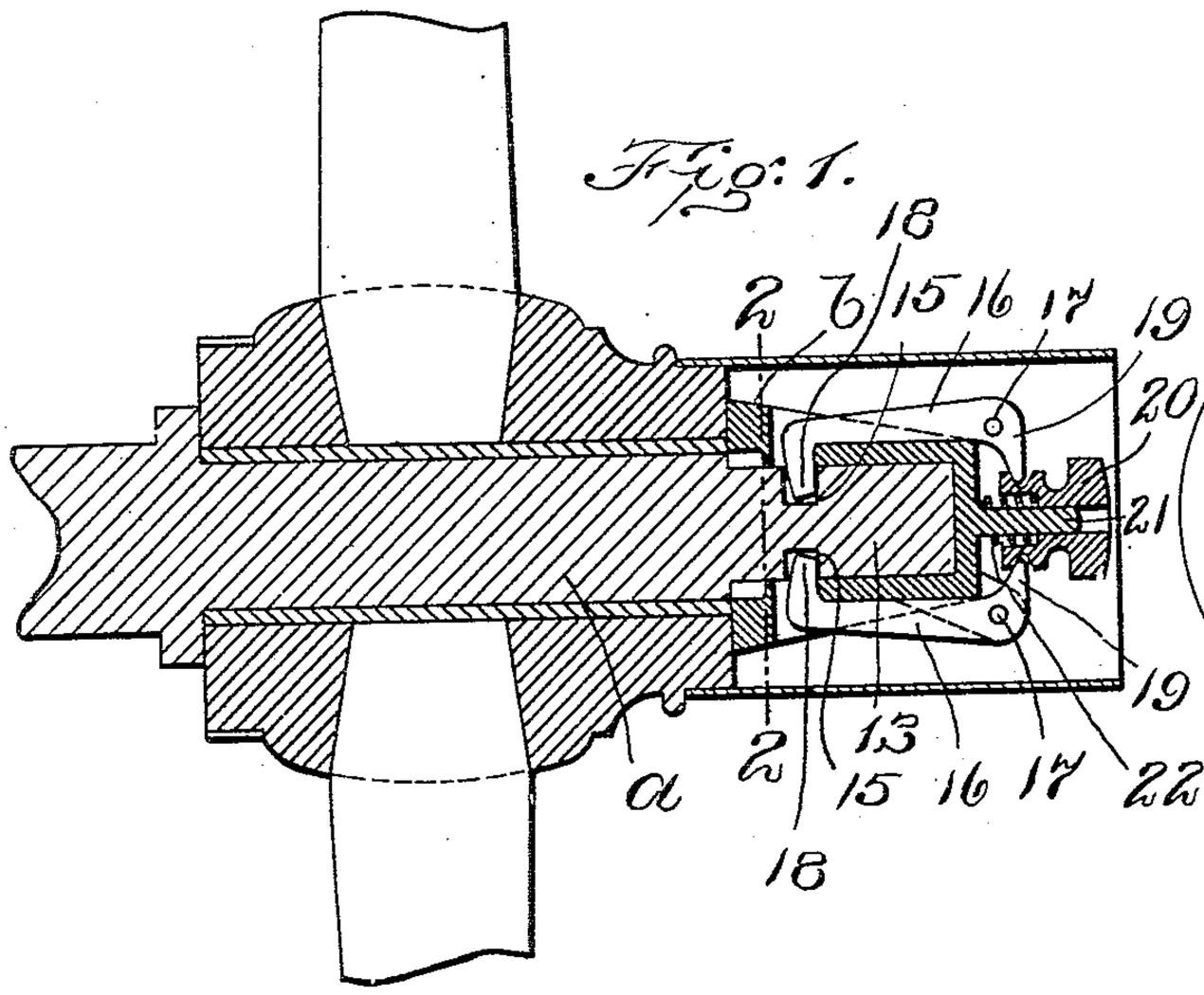


Fig. 2.

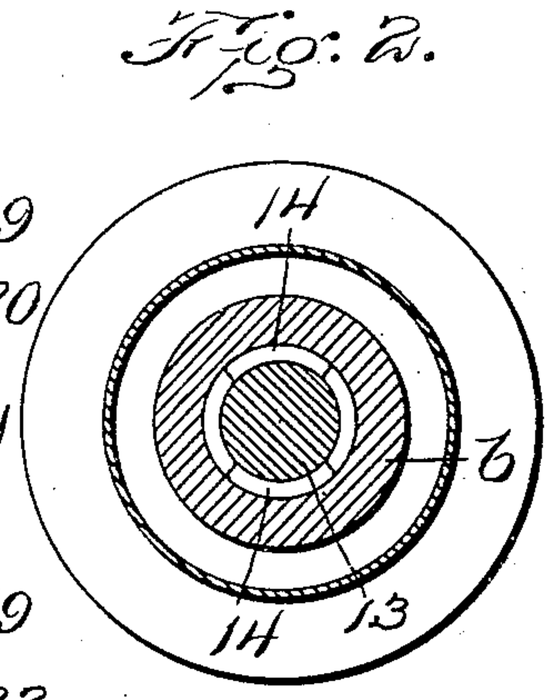


Fig. 3.

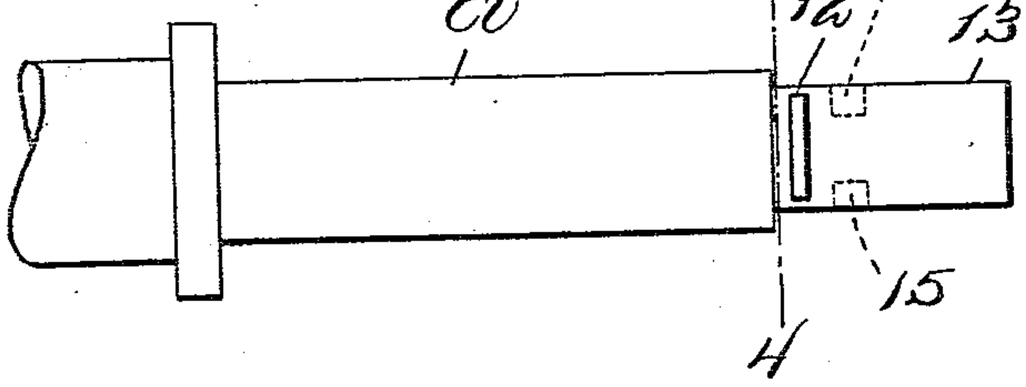


Fig. 4.

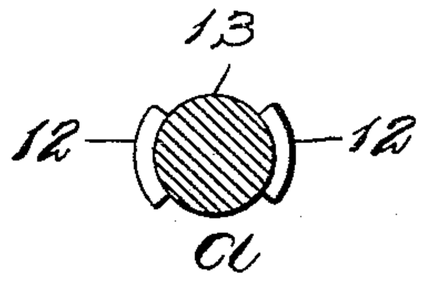


Fig. 5.

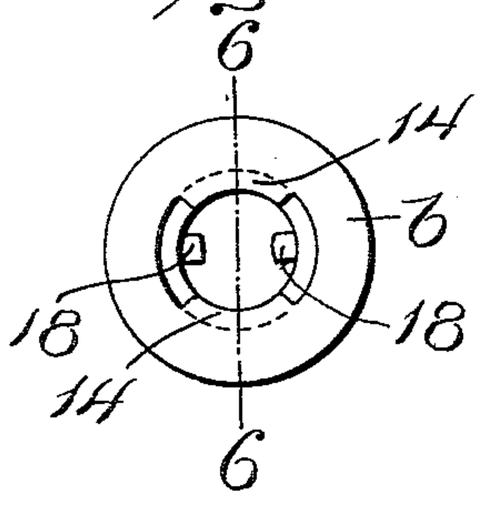
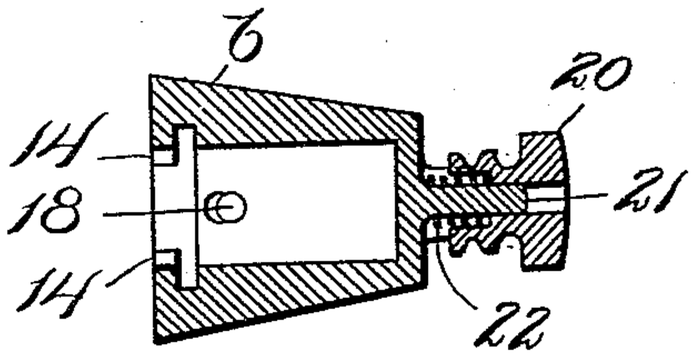


Fig. 6.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 745,989. Patented December 8, 1903.

UNITED STATES PATENT OFFICE.

WILLIAM E. AYRES, OF BOSTON, MASSACHUSETTS.

WHEEL-SECURING DEVICE.

SPECIFICATION forming part of Letters Patent No. 745,989, dated December 8, 1903.

Application filed May 8, 1903. Serial No. 156,165. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. AYRES, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Wheel-Securing Devices, of which the following is a specification.

This invention has for its object to provide as a substitute for the ordinary screw-threaded nut used to secure the wheel-hub upon a carriage-axle arm a quickly attachable and removable wheel-securing cap or collar adapted to be engaged with the arm in such manner that its accidental removal will be impossible.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a longitudinal section of one end of an axle-arm with a wheel-securing cap or collar applied thereto in accordance with my invention. Fig. 2 represents a section on line 2 2 of Fig. 1. Fig. 3 represents a plan view of the arm. Fig. 4 represents a section on line 4 4 of Fig. 3. Fig. 5 represents a view of the inner end of the cap or collar. Fig. 6 represents a section on line 6 6 of Fig. 5.

The same reference characters indicate the same parts in all the figures.

In the drawings, *a* represents an axle-arm, and *b* represents a wheel-securing cap or collar engaged with the outer portion of the arm, so as to form a stop for the outer end of the wheel-hub, said stop being an equivalent of the usual screw-threaded nut. The arm *a* and cap *b* are provided with primary complemental connecting members adapted to be interlocked by a partial rotation of the cap on the arm after the cap has been moved inwardly on the arm as far as it will go. The said complemental connecting members comprise two segmental outwardly-projecting wings 12 12, formed on the reduced cylindrical outer portion 13 of the arm, and two inwardly-projecting segmental wings 14 14, formed in the interior of the cap *b*. The cap has a cavity formed to fit closely the reduced cylindrical outer portion 13, and said cavity has an enlargement at its open end, the wings 14 being formed in said enlargement. The form and arrangement of the wings 12 12 and 14 14 are such that the cap when turned to a given position cannot be moved inwardly on the axle-arm until the wings 14 of the cap pass between the wings 12 of the arm, after which the wings 12 and 14 can be interlocked by a partial rotation of the cap upon the arm. When the wings are thus interlocked, the cap can be removed only by a partial reverse rotation sufficient to permit the wings 14 to pass outwardly between the wings 12.

The arm *a* and cap *b* are further provided with supplemental complementary connecting members adapted to interlock only when the above-described primary members are interlocked, the said secondary connecting members not only coöperating with the primary members in preventing outward movement of the cap upon the arm, but also preventing the rotary movement of the cap necessary to permit the disengagement of the primary connecting members.

The secondary connecting members comprise sockets 15 15, formed on opposite sides of the reduced portion 13 of the arm, and levers 16 16, pivoted at 17 17 to the cap *b* and provided with studs 18 18, adapted to enter the sockets 15 15. The levers 16 occupy longitudinal slots or recesses formed for their reception in the cap and are provided at their outer ends with inwardly-projecting arms 19 19, which engage a peripheral groove in a movable knob or push-piece 20. Said push-piece is movable on a stud 21, formed on the outer end of the cap, and is normally pressed outwardly by a spring 22. Said spring acts through the push-piece 20 to normally force the arms 19 outwardly, and thus force the studs 18 into the sockets 15. The sockets 15 alternate with the wings 12, and the studs 18 alternate with the wings 14. The sockets 15 and studs 18 are therefore so arranged relatively to each other and to the wings 12 and 14 that the studs cannot enter the sockets until the cap *b* has been turned to cause the wings 14 to interlock with the wings 12. When this has been done, the studs 18 register with the sockets 15 and are forced by the spring 22 into said sockets, as indicated in Fig. 1.

When the cap *b* is to be applied to the arm *a*, the operator presses the push-piece 20 inwardly, forcing the lever-arms 19 inwardly and the studs 18 outwardly. The operator then places the cap upon the axle-arm in such position that the wings 14 of the cap can pass between the wings 12 of the arm. After forcing the cap inwardly as far as it will go the operator then gives the cap a quarter-turn, thus engaging the wings 14 with the wings 12, and at the same time releases the push-piece, so that the studs 18 will spring into the sockets 15. The cap is thus simply engaged with the arm, the two sets of connecting members coöperating to prevent outward movement of the cap upon the arm, the rotation of the cap on the arm necessary to permit the disengagement of the wings 12 and 14 being prevented by the engagement of the studs 18 with the sockets 15.

In removing the cap from the arm the operator presses in the push-piece and reverses the described operation.

I claim—

1. A wheel-securing cap or collar having an axle-arm-receiving cavity or socket, orifices communicating with said socket, pivoted levers having studs movable in said orifices and formed to engage an axle-arm in the socket, said levers having arms projecting inwardly over the outer end of the cap, and a spring-pressed push-piece supported by the cap and engaged with said arms.

2. A wheel-securing cap or collar formed internally to receive and engage an axle-arm and having a stud at its outer end, a spring-pressed push-piece movable on said stud, and axle-arm-engaging levers pivoted to the cap and engaged with said push-piece.

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

WILLIAM E. AYRES.

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