

(No Model.)

S. S. ARNOLD.  
BOX FOR WHEEL HUBS.

No. 510,229.

Patented Dec. 5, 1893.

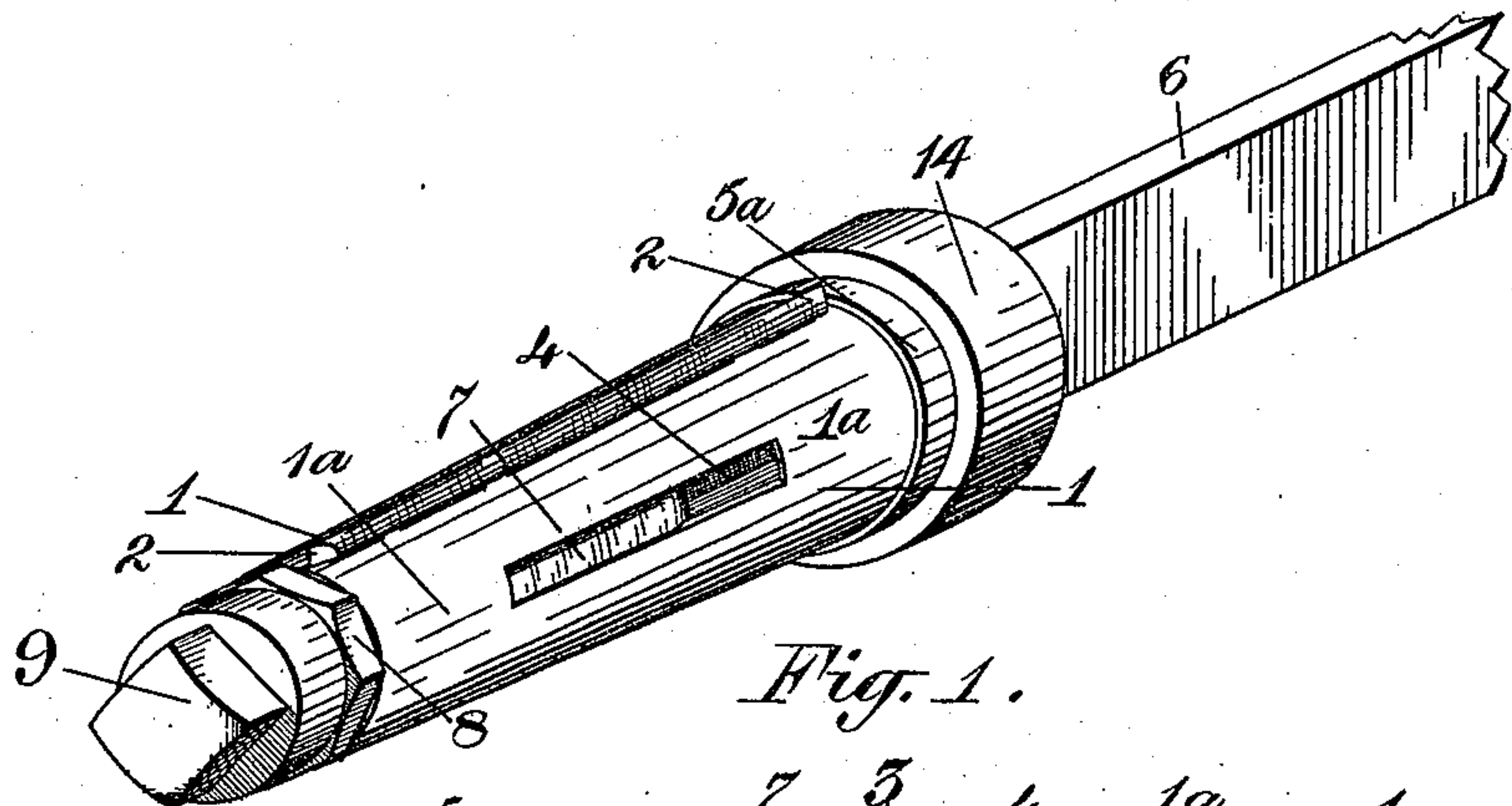


Fig. 1.

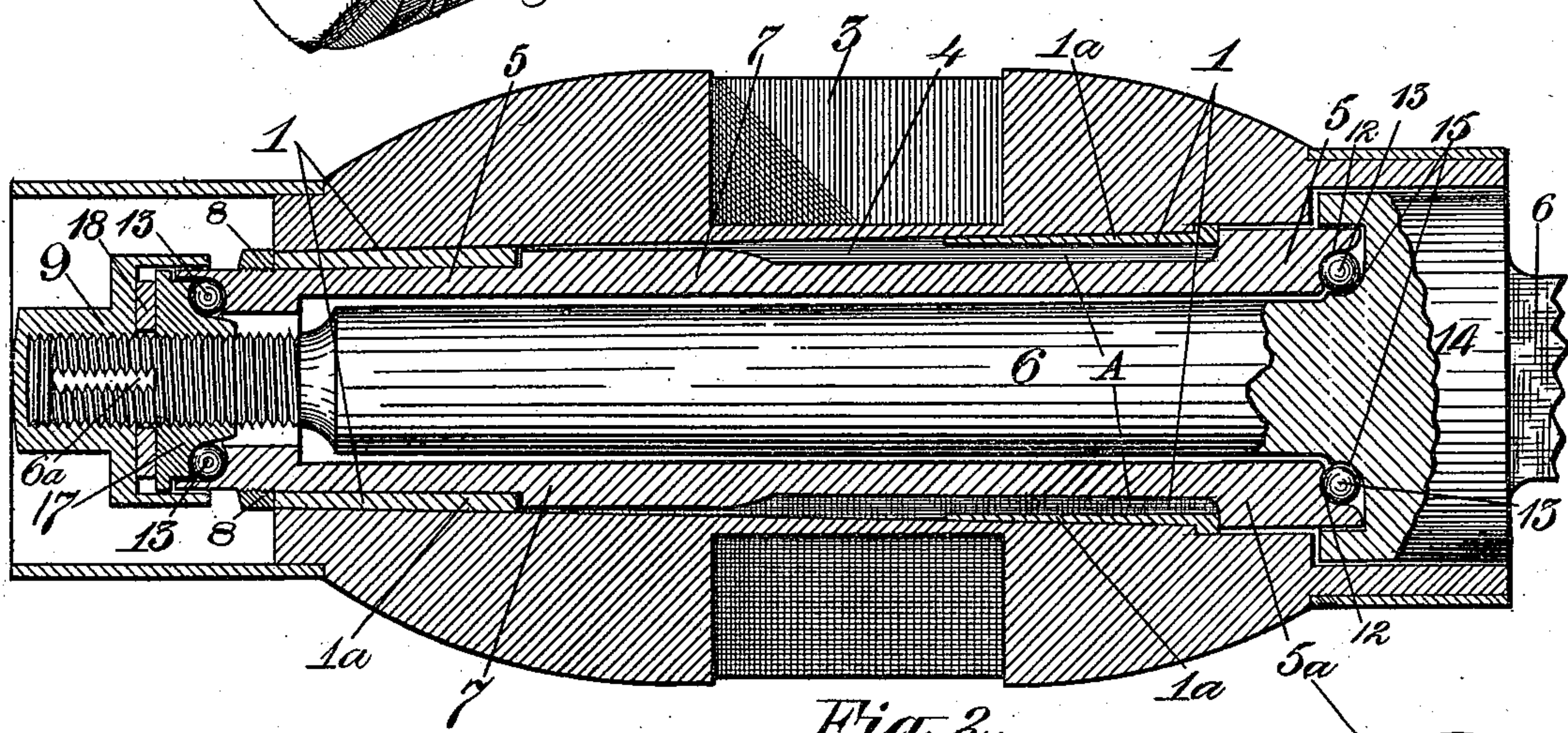


Fig. 2.

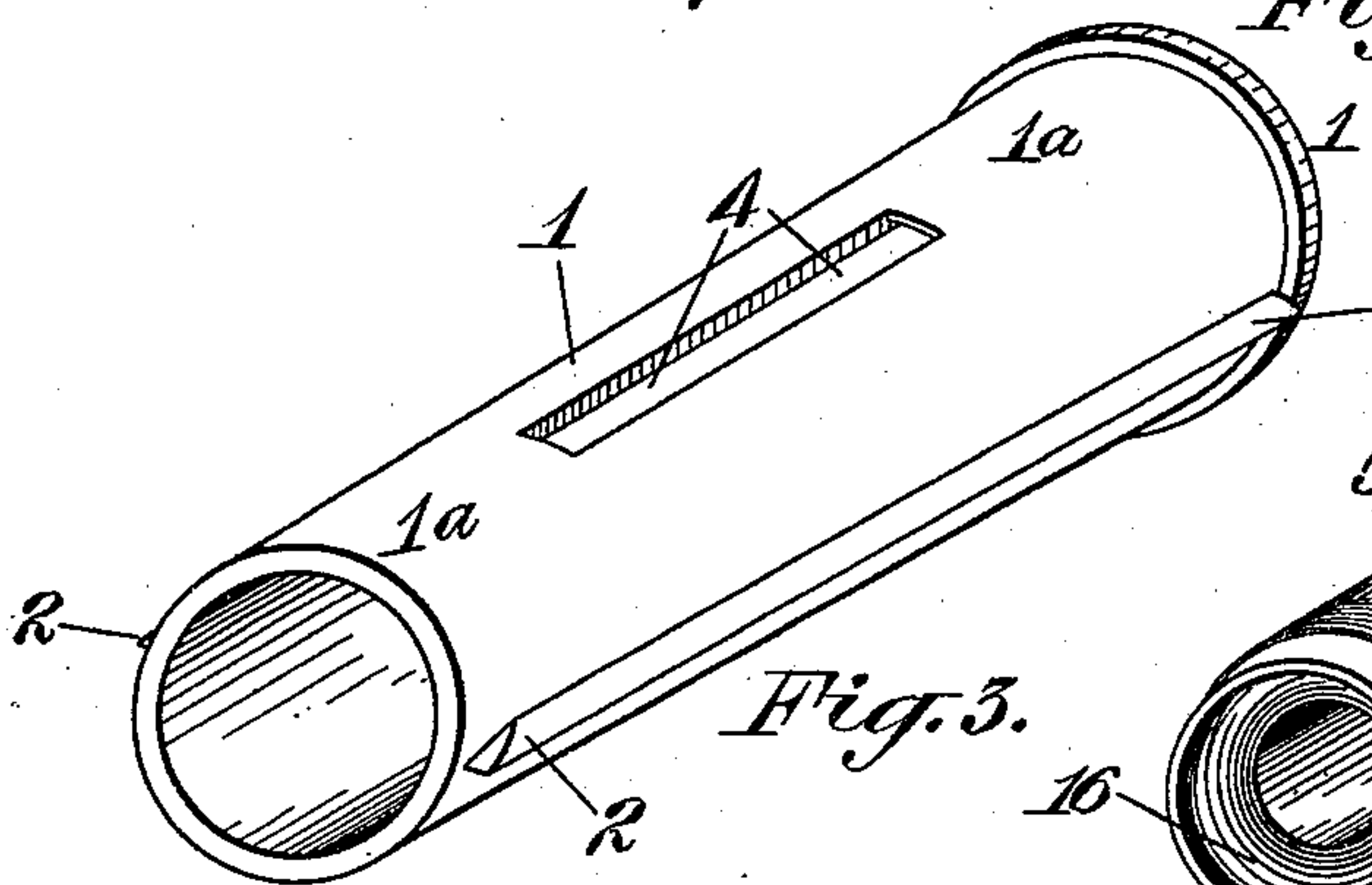


Fig. 3.

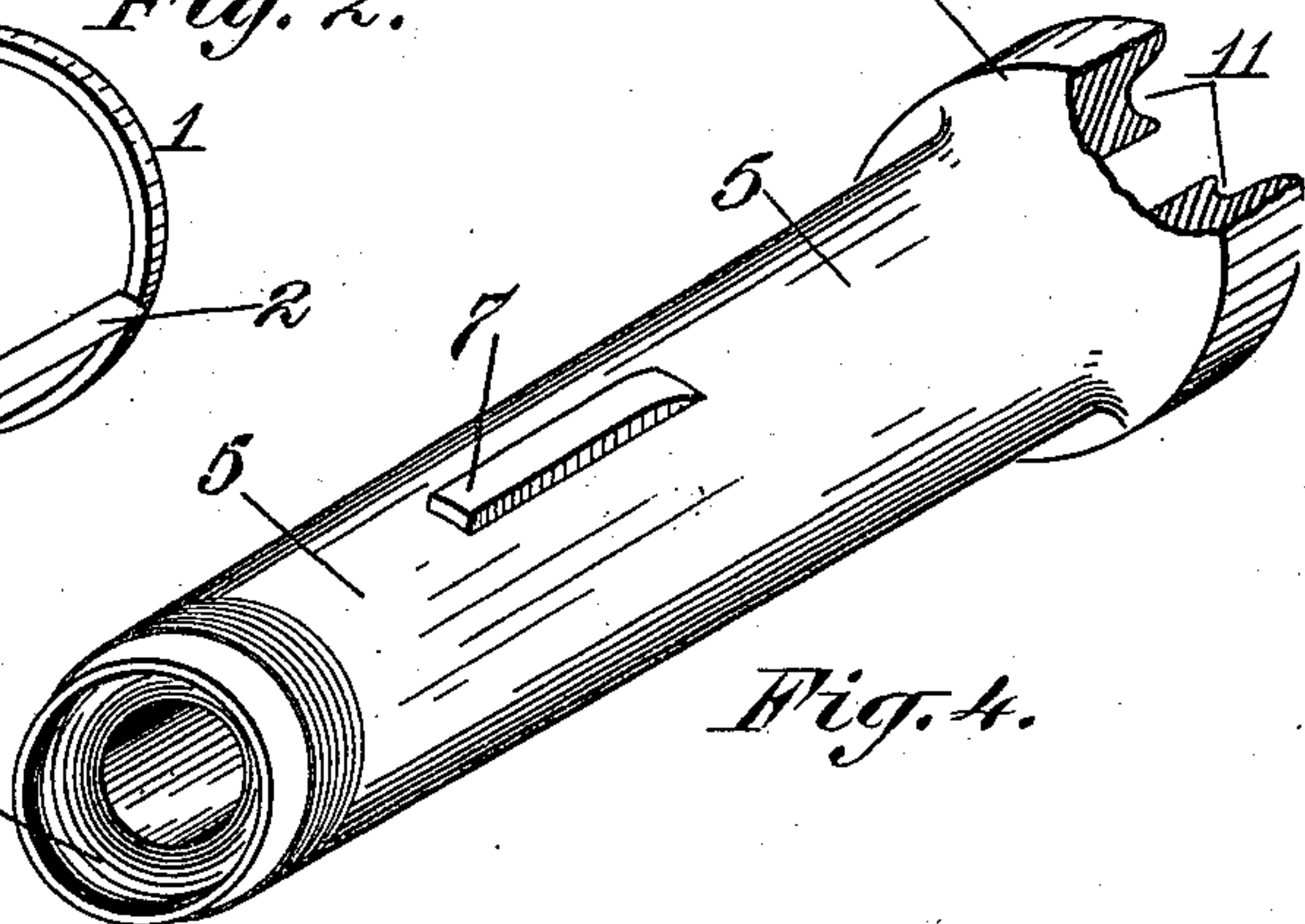


Fig. 4.

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# UNITED STATES PATENT OFFICE.

SAMUEL STEPHEN ARNOLD, OF TORONTO, CANADA.

## BOX FOR WHEEL-HUBS.

SPECIFICATION forming part of Letters Patent No. 510,229, dated December 5, 1893.

Application filed March 31, 1893. Serial No. 468,518. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL STEPHEN ARNOLD, commercial traveler, of Toronto, county of York, Province of Ontario, Canada, have invented a certain new and useful Lock-Box for Wheel-Hubs; and I hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to a device whereby the wheel-hub can be securely locked to its respective journal box and the wheel and its journal box will be compelled to revolve together while the wheel is upon its axle, and also to so construct the said device that when it is necessary to remove the wheel from the axle the wheel can be removed without the necessity of removing the journal box or bearings; and the invention consists essentially of the device hereinafter more fully set forth in the specification and more particularly pointed out in the claims.

In the drawings:—Figure 1 is a perspective view of a section of an axle, the journal box and the lock box. Fig. 2 is a sectional view showing the same parts and the lock box fitted into the wheel-hub. Fig. 3 is a perspective view of the lock-box. Fig. 4 is a perspective view of the journal-box.

Like numerals of reference refer to like parts throughout the specification and drawings.

The lock-box consists essentially of a metallic shell 1, of any suitable size and shape and is provided with two outwardly extending flanges 2, which serve as splines to enter the wood work surrounding the bore of the hub to lock the said metallic shell 1 to the hub 3.

In the drawings I have shown the metallic shell 1 to be constructed particularly for a buggy, or vehicle wheel, but the device may also be employed in any form of wheels whatever, such as, car-wheels, turbine or water wheels, loose pulleys or in the hub of any other device revolving on its axis. The metallic shell 1, as before stated, is driven into the bore of the hub and is locked therein by the splines 2 entering the wood work surrounding the bore and consequently the said metallic shell is compelled to revolve with the said hub. Formed in the metallic shell 1 are two or more longitudinal slots 4 diametrically

opposite each other and preferably arranged at right angles to the flanges 2. By reference to the drawings it will be noticed that these slots 4 are formed in the central portion of the walls of the metallic shell 1 and that between each end of the said slots and the ends of the said metallic shell 1 is a band of metal 1<sup>a</sup>. The object of this construction is to prevent the sides of the said walls closing upon each other while the metallic shell is being driven into the wood work of the hub, the band 1<sup>a</sup> being of sufficient strength to cause the said metallic shell to retain its proper form and resist all strains upon it from the hub 3. The bore of the metallic shell 1 is arranged to fit snugly the journal-box 5 which runs upon the axle 6. The journal-box 6 is provided with wings or ribs 7 to fit the longitudinal slots 4. The entrance of the wings or ribs 7 into the slots 4 lock together the journal-box and the metallic shell and cause the simultaneous revolution of the said metallic shell and the said journal-box. The journal-box 5 is provided with a shoulder 5<sup>a</sup> on its inner end and against this shoulder 5<sup>a</sup> abuts the inner end of the metallic shell 1. The inner end of the metallic shell 1 is provided with a shoulder or circular flange 1<sup>a</sup> which abuts against the wood work of the side of the hub 3 and prevents the metallic shell entering too far into the bore of the said hub. The outer end of the journal-box 5 is screw threaded, and fitted on the screw threaded portion of the said journal-box is a nut 8 which is screwed against the outer end of the metallic shell 1 and prevents the metallic shell and consequently the hub shifting its position on the journal box 5. As before stated the metallic shell 1 is locked or securely fastened to the hub 3, and it might now be stated that the journal-box 5 is locked on the axle 6 by means hereinafter set forth.

When it is necessary to remove the wheel from the boxing the dust nut 9 and the nut 8 are removed and the metallic shell 1, with the hub and wheel, is slid along the journal-box until the said metallic shell shall have cleared the end of the journal box and the axle.

To provide a means for oiling the axle in event of rust or dampness I have formed through the journal-box 5 to the axle 6 a passage 10 by means of which oil is fed to the



axle. The inner end of the journal box 5 is enlarged to form a cup-shaped recess 11 which has a hardened bearing surface 12. On the bearing surface 12 is adapted to run the hardened steel balls 13.

Formed on the axle 6 contiguous to the recess 11 is a cap 14 which incloses the end of the journal-box 5 and closes the end of the recess 11. On the axle 6 and within the cap 14 is an enlargement 15 which is hardened to provide a surface for the balls 13 to run on, the balls 13 running on the two surfaces 12 and 15.

The outer end of the journal-box 5 is provided with a cup-shaped recess 16 the surface of which is hardened, and fitted to the outer end of the axle 6 is a nut 17 to close the end of the recess 16. The nut 17 is provided with a cone-shaped surface 17<sup>a</sup>. The balls 13 within the recess 16 travel on the hardened surface of the recess and on the hardened cone-shaped surface 17<sup>a</sup> of the nut 17. The bore of the journal box 5 is sufficiently large to prevent the metal which surrounds the said bore coming in contact at any time with the axle 6. The bearing surfaces of the said journal-box at all times turn on the balls 13 within the recesses respectively 11 and 16. Consequently the journal box touches the axle at no point whatever, thus preventing the occurrence of any friction at any point except on the balls 13, which being of hardened metal reduces the friction to a minimum amount. The nut 17 closing the end of the journal box 5 is slightly less in diameter than the diameter of the hole or opening through the nut 8 to permit of the said nut being removed from or replaced on the screw threaded end of the journal-box 5 without the necessity of interfering with the said nut 17, and on the outer side of the nut 17 is a washer 18 equal in diameter to the nut 17 to allow the nut 8 passing thereover.

It will be noticed by reference to the drawings that the threaded end of the axle 6 is a flattened surface 6<sup>a</sup>, and with this flattened surface 6<sup>a</sup> engages the flattened surface 19 of the hole through the washer 18. This construction prevents the washer revolving and allowing the nut 17 to unthread itself from the end of the axle 6.

Inclosing the washer 18 and nut 17 and end of the journal-box 5 is a dust nut 9 which it is always necessary to remove before the nut 8 can be unscrewed and the hub and wheel removed.

By reference to the drawings it will be noticed that extending inwardly from the end

of the metallic shell to each of the longitudinal slots is a groove or channel A into which enters the wing or rib on the outer side of the journal box 5 to permit of the passage of the said wing or rib to the said longitudinal slots.

The essential feature of the invention consists in the means for removably locking the hub to the journal box and this means can be as readily employed on the axle and journal-box of any form whatever and provided with any style of bearing surface.

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

1. The combination of the hub, a metallic shell within the bore of the hub, means for securing the said metallic shell to the hub, the axle, a journal-box on the axle, and means for locking together the metallic shell and the journal box, substantially as set forth.

2. The combination of the hub, a metallic shell within the bore of the hub, means for securing together the metallic shell and the hub, said metallic shell having formed therein longitudinal slots, the axle, a journal-box on the axle, wings or ribs on the outer side of the journal box adapted to enter into the longitudinal slots in the metallic shell, substantially as and for the purpose set forth.

3. The combination of the hub, a metallic shell within the bore of the hub, flanges on the outer side of the metallic shell adapted to enter the material surrounding the bore of the hub to secure together the said shell and hub, the said shell having formed in it a series of longitudinal slots, a flange encircling the end of the metallic shell to butt against the side of the hub, the axle, a journal-box on the axle, ribs on the outer side of the journal box adapted to enter the longitudinal slots, substantially as and for the purpose set forth.

4. The combination of the hub, a metallic shell within the bore of the hub, said metallic shell having longitudinal slots formed centrally therein, and a band of metal at either end, longitudinal flanges on the outer side of the said shell to enter the material surrounding the bore of the hub, the axle, a journal box on the axle, wings or ribs on the outer side of the journal box adapted to enter the longitudinal slots in the metallic shell, substantially as and for the purpose set forth.

Toronto, March 15, 1893.

SAMUEL STEPHEN ARNOLD.

In presence of—

C. H. RICHES,

MARGUERITE ANGELL.