

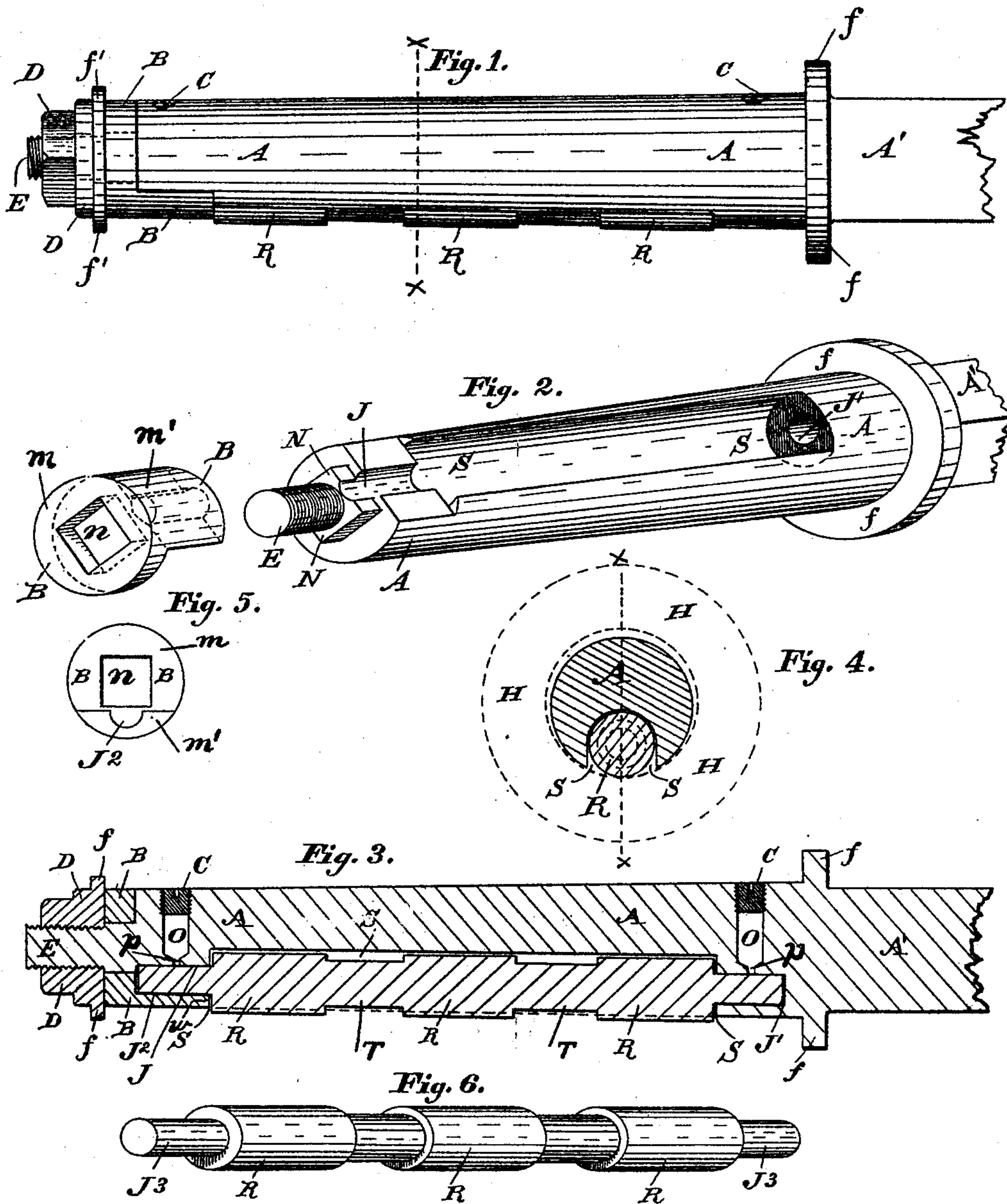
(No Model.)

W. I. COREY.

AXLE.

No. 328,010.

Patented Oct. 13, 1885.



WITNESSES:

C. W. Bogart
O. M. Hill

INVENTOR

Willard I. Corey
per Wm. Hubbell Fisher,

ATTORNEY

UNITED STATES PATENT OFFICE.

WILLARD I. COREY, OF CINCINNATI, OHIO.

AXLE.

SPECIFICATION forming part of Letters Patent No. 328,010, dated October 13, 1885.

Application filed March 12, 1885. Serial No. 158,539. (No model.)

To all whom it may concern:

Be it known that I, WILLARD I. COREY, of the city of Cincinnati, in Hamilton county and State of Ohio, have invented certain new and useful Improvements in Axles, of which the following is a specification.

The principal object of my invention is to provide an axle which will diminish the friction between itself and the wheel with which it is used.

In the accompanying drawings, making part of this specification, Figure 1 is a side elevation of the end portion of an axle embodying my invention. Fig. 2 is a perspective view of the said end portion of the said axle turned upside down, and showing among other things the cavity for the reception of the anti-friction roller, the cap being detached from the axle. Fig. 3 is a central vertical longitudinal section of that portion of the axle and its attachments united, as shown in Fig. 1. Fig. 4 is a cross-section of the axle, taken through the line *xx*, Fig. 1, and showing in circular dotted lines a hub surrounding said axle. Fig. 5, detail No. 1, is a perspective view of the cap which forms the end of the axle, the said cap being turned upside down, and detail No. 2 is another view of the said cap turned right side up and looking at that end of the latter which is at the right hand in detail No. 1; Fig. 6, view in perspective of anti-friction roller.

Broadly considered, my device consists of an axle containing a roller journaled therein, and which roller rests upon that portion of the inner surface of the hub of the wheel which would otherwise touch the said axle.

In the particular device illustrated, the end of the axle *A* on which the wheel turns is provided with a deep groove, *S*, extending nearly from end to end of the part *A* for the reception of the roller *R*. The journal-bearing for the roller may be formed in any suitable manner.

A preferred, novel, and valuable mode of forming said journal-bearings (which mode is also of my invention) is shown in the accompanying drawings, and will now be described.

From the inner end of the groove *S* a cylindrical opening, *J'*, extends into the shaft of the axle. The outer end of the axle is preferably flattened, as shown in Fig. 2, and in the

flattened surface is made a hemi-cylindrical groove, *J*. On the end of the shaft is a square projection, *N*, whose center coincides with the center of the axle-shaft. This projection is cast with or otherwise firmly secured to the axle. From the center of the projection *N* a screw, *E*, projects in the line of the axle. At the inner portion of the axle end the usual collar, *f*, is shown.

In Fig. 5 the axle-cap *B* is illustrated. It may be described as consisting of a cylindrical piece, *m*, from one end of which the tongue *m'* projects. A square opening, *n*, of such size as to fit snugly over the projection *N*, is made in the center of the circular piece *m*, and in the tongue *m'* a groove, *J'*, corresponds to the groove *J*.

Means for delivering lubricating material to the adjacent surfaces of the axle and hub may be present, as may also a receptacle or receptacles for holding the lubricating material before it is so delivered. Preferred means of my invention for this purpose are shown, and are as follows: In the section Fig. 3 are shown two holes, *O O'*, drilled into or otherwise formed in the axle, one communicating with the opening *J*, while the other communicates with the groove *J'* through contracted orifices *p p*. These holes serve as reservoirs for the lubricating fluid, and are closed by any appropriate means, preferably by countersunk screws, as illustrated. The roller *R* is usually made of solid metal, and preferably has its diameter at one or more points or places, *T*, so as to still further reduce the friction; but it may be made of a uniform diameter throughout. At each end it has a journal, *J'*, one of which fits in the opening *J'*, and the other in the groove *J*, and is covered by the groove *J'*. The usual nut, *D*, to keep the wheel in position, is screwed onto the screw-threaded pin *E*. The roller *R* is first put in place and then the cap *B* put in place, so that the opening *n* fits over the projection *N*, and the tongue *m'* fits over the flattened space at the end of the axle, and the groove *J'* fits over the journal *J'*, the end of the tongue *m'* being preferably, as shown, in close proximity to the adjacent shouldered end of the axle. The axle is now ready to receive the wheel, and after the wheel has been adjusted on the axle the latter is completed by the nut *D* being screwed into position. As

shown in Figs. 1, 3, and 4, the roller projects slightly beyond the surface of the journal A, or beyond where that surface would have been had the groove B not been cut. Now, when the roller is placed downward, as in Fig. 3, it is evident that it will bear against the wheel to the almost total exclusion of the journal A, which will serve merely as a guide for the motion of the wheel. In this way the total friction is much reduced.

The axle is adapted for use with either light or heavy vehicles. The simplicity of its structure renders its manufacture simple as well as cheap. The article is, moreover, efficient and not liable to derangements.

When preferred, the long roller R may be transversely divided one or more times, thus forming two or more short rollers. In such event suitable journal-bearings will be provided for the journals of said rollers.

I contemplate the application of my invention or one or more of its features not only to the axles of large vehicles, but also to smaller vehicles of various kinds, and also to roller-skates and the like, and wish to be understood as claiming the right of such applications.

While the several features of my invention are preferably employed together, one or more of said features may be employed without the remainder. In so far as applicable, one or more of said features may be employed in connection with axles of a construction other than that specifically herein described.

What I claim as new and of my invention, and desire to secure by Letters Patent, is— 35

1. The combination of the axle, roller R, journaled therein, the axle having bearing J', and flattened end having bearing J, and cap B, provided with tongue *m'*, having groove J², substantially as and for the purposes specified. 40

2. The combination of the axle and roller R, journaled therein in bearing, as J', and bearing lying in the flattened end of the axle, and said flattened end having angular projection N, and cap B, having tongue *m'*, provided with groove J², and angular opening *n*, and screw-pin and nut, substantially as and for the purposes specified. 45

3. An axle provided with an anti-friction roller, the inner end of said anti-friction roller being so journaled in the solid axle that its journal end is completely surrounded by the solid axle, substantially as and for the purposes specified. 50

4. The axle provided with an anti-friction roller, the inner end of said anti-friction roller being so journaled in the solid axle that the journal-bearing of the said anti-friction roller is completely surrounded by the solid axle, the bearing being also situated in the journal portion of the axle external to the inner rim, substantially as and for the purposes specified. 55 60

WILLARD I. COREY.

Witnesses:

W. H. BALL,
JNO. W. STREHLI.