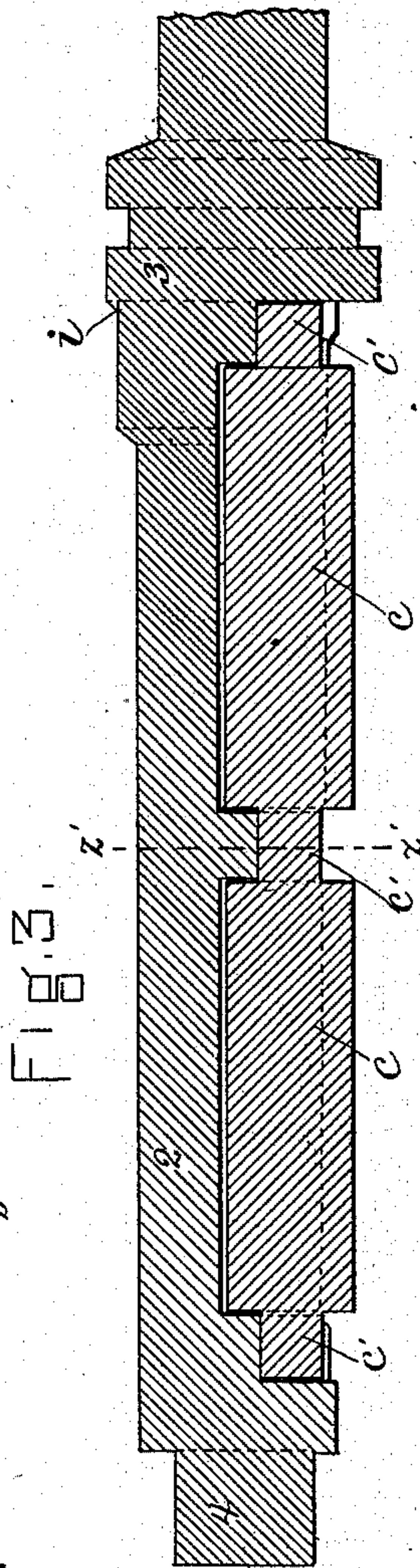
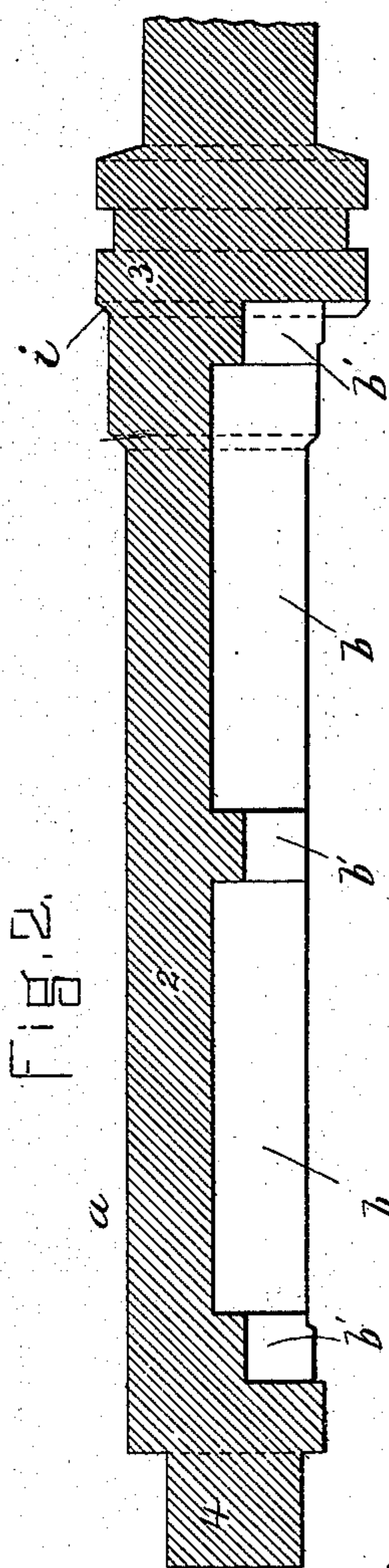
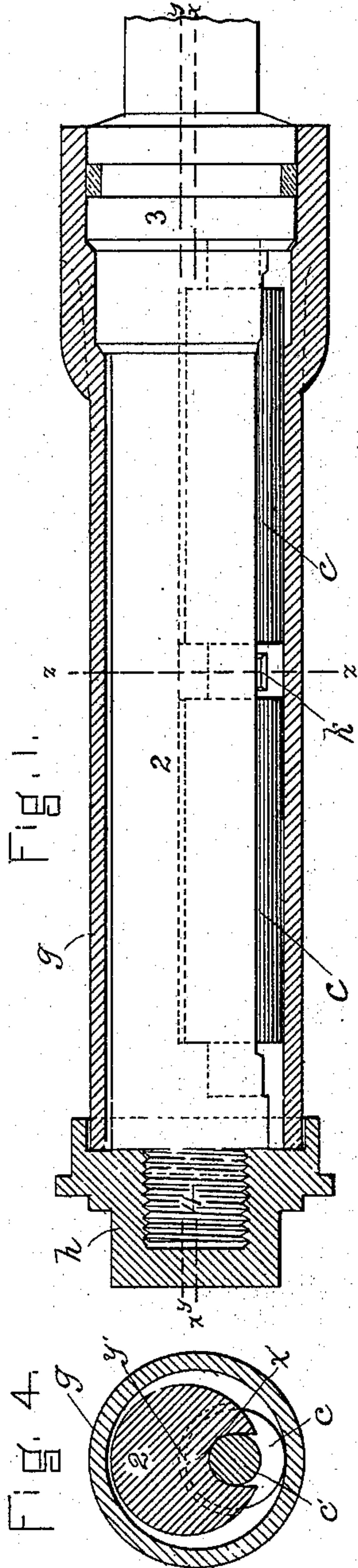


(No Model.)

E. F. ROBBINS.
CARRIAGE AXLE.

No. 413,559.

Patented Oct. 22, 1889.



WITNESSES.
A. O. Hanson.
W. C. Ramsay.

INVENTOR:
E. F. Robbins
By Myself Brown Connelley
Atty.

UNITED STATES PATENT OFFICE.

ELISHA F. ROBBINS, OF CAMBRIDGE, ASSIGNOR TO THOMAS J. OLYS, OF
BOSTON, MASSACHUSETTS.

CARRIAGE-AXLE.

SPECIFICATION forming part of Letters Patent No. 413,559, dated October 22, 1889.

Application filed December 10, 1888. Serial No. 293,116. (No model.)

To all whom it may concern:

Be it known that I, ELISHA F. ROBBINS, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain
5 new and useful Improvements in Carriage-Axles, of which the following is a specification.

This invention relates to carriage-axles the spindles of which are provided with longitudinal anti-friction rollers to run in rolling
10 contact with the axle-box.

The invention consists in an axle-spindle having the main portion, which contains the said roller, made slightly offset from or eccentric to the end portions of the spindle, the
15 extent to which said main portion is offset being equal to the extent of the projection of the anti-friction roller outside of the periphery of the spindle at a point opposite said offset portion, so that the line of contact of
20 the periphery of the anti-friction roll with the axle-box will be at the same distance from the axial center of said box as a line along the periphery of the spindle at a point diametrically opposite to the outer portion of the anti-
25 friction roll, while the end portions of the axle are concentric with the axial center of the box, all of which I will now proceed to describe and claim.

Of the accompanying drawings, forming a
30 part of this specification, Figure 1 represents a side view of an axle-spindle embodying my invention and a sectional view of the box. Fig. 2 represents a longitudinal section of the spindle, the roller being removed. Fig. 3
35 represents a longitudinal section of the spindle and roller. Fig. 4 represents a section on line $z z$, Fig. 1. Fig. 5 represents a section on line $z' z'$, Fig. 3.

The same letters of reference indicate the
40 same parts in all the figures.

In the drawings, a represents the spindle of a carriage-axle, the same being composed of the main portion 2, having a longitudinal groove or recess b , in which are the bearings
45 b' of the anti-friction roll c , and the end portions 3 4 at opposite ends of the main portion 2. The portion 3 at the inner end is a circular collar or enlargement formed on the spindle and closely fitting a cavity in the inner
50 end of the axle-box g to act both as a stop to limit the inward movement of the box on the

spindle and as a guard to prevent the entrance of dirt, &c., between the spindle and box. The end portion 4 is reduced and screw-threaded to receive the nut h , that retains the
55 hub upon the spindle.

In carrying out my invention I make the main portion 2 of less than the diameter required to fill the axle-box and offset said portion from the end portions 3 4, the main portion being turned on a lathe while running
60 on a center that is eccentric to the center on which the spindle rotates when the portions 3 4 are being turned. In other words, I turn the main portion 2 on one center and the
65 end portions 3 4 on another center, so that while the main portions 3 4 have the same axial center, the main portion 2 has a different center and is eccentric to the portions 3 4. The two centers are indicated in Fig. 1 by
70 the dotted lines $x x y y$ and in Fig. 4 by the letters $x' y'$.

The roller c projects outside of the portion 2 of the spindle, so that the lowest part of its periphery, which bears on the box g , is at the
75 same distance from the line $x x$, Fig. 1, as the highest part of the periphery of the portion 2, said highest and lowest parts bearing on the box at points diametrically opposite each other, as shown in Figs. 1 and 4. It will be
80 seen, therefore, that the described eccentricity of the portion 2 and the projection of the roller c therefrom enable the portion 2 and its roller to fit snugly within a box which is
85 concentric with the end portions 3 4, so that the box will run easily on all parts of the spindle without binding on any part, and at the same time will fit all parts closely, so that there will be no rattling of the box on the
90 axle and no admission of dirt between the bearing-surfaces.

The shoulder i , that connects the portion 2 with the enlargement 3, is beveled, as shown in Figs. 1 and 3, to increase the strength and prevent liability of breakage at this point.
95

To prevent the roller from dropping out when the box is removed from the spindle, I fit a segmental slide k in a groove in the periphery of the portion 2, said slide being arranged to extend across one of the reduced
100 portions or journals c' of the roll c , as shown in Fig. 5, and thereby hold the roll in place

when the hub is removed. By sliding said plate back the roll may be released.

I claim—

1. An axle-spindle composed of the end sections 3 4 and the intermediate section 2, offset from or eccentric to the end sections, and provided with the anti-friction roller *c*, which projects from the section 2, as described, combined with a box which is concentric with the end sections 3 4 and bears on the section 2 and roller *c* at diametrically-opposite points, as set forth.

2. The combination of the axle-spindle composed of end sections 3 4, the former having a beveled shoulder, and the intermediate section offset from or eccentric to the end sections and having a longitudinal recess, the

anti-friction roller in said recess, and the box which is concentric with the end sections and provided with an inner beveled shoulder, substantially as set forth.

3. An axle-spindle having a longitudinal recess, a roller *c* in said recess, and a segmental slide fitted in the periphery of the spindle and arranged to retain the roller in its recess, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 1st day of December, A. D. 1888.

ELISHA F. ROBBINS.

Witnesses:

C. F. BROWN,

W. C. RAMSAY.