

(No Model.)

A. W. HALL.  
ANTI FRICTION JOURNAL BOX.

No. 304,523.

Patented Sept. 2, 1884.

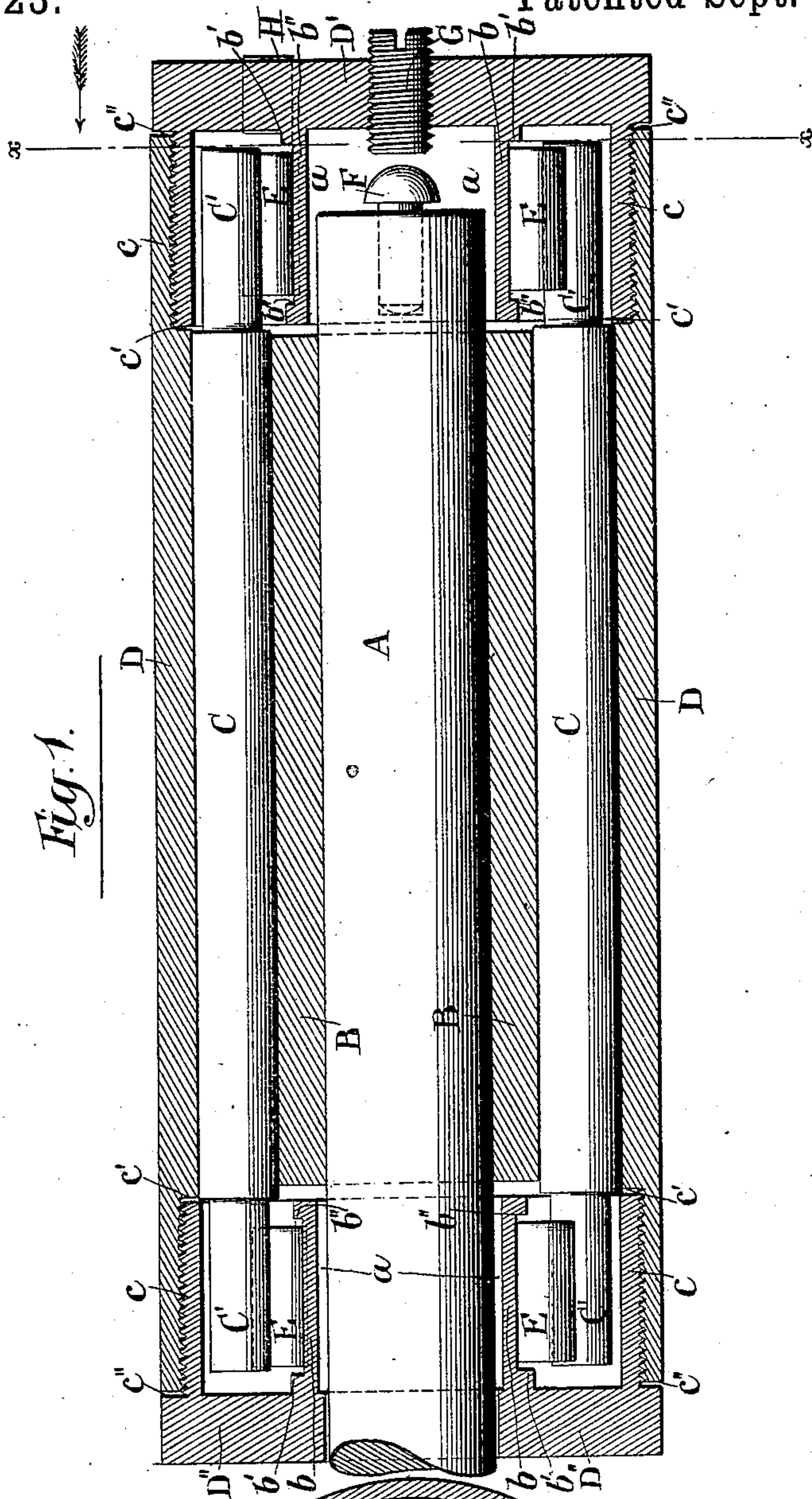
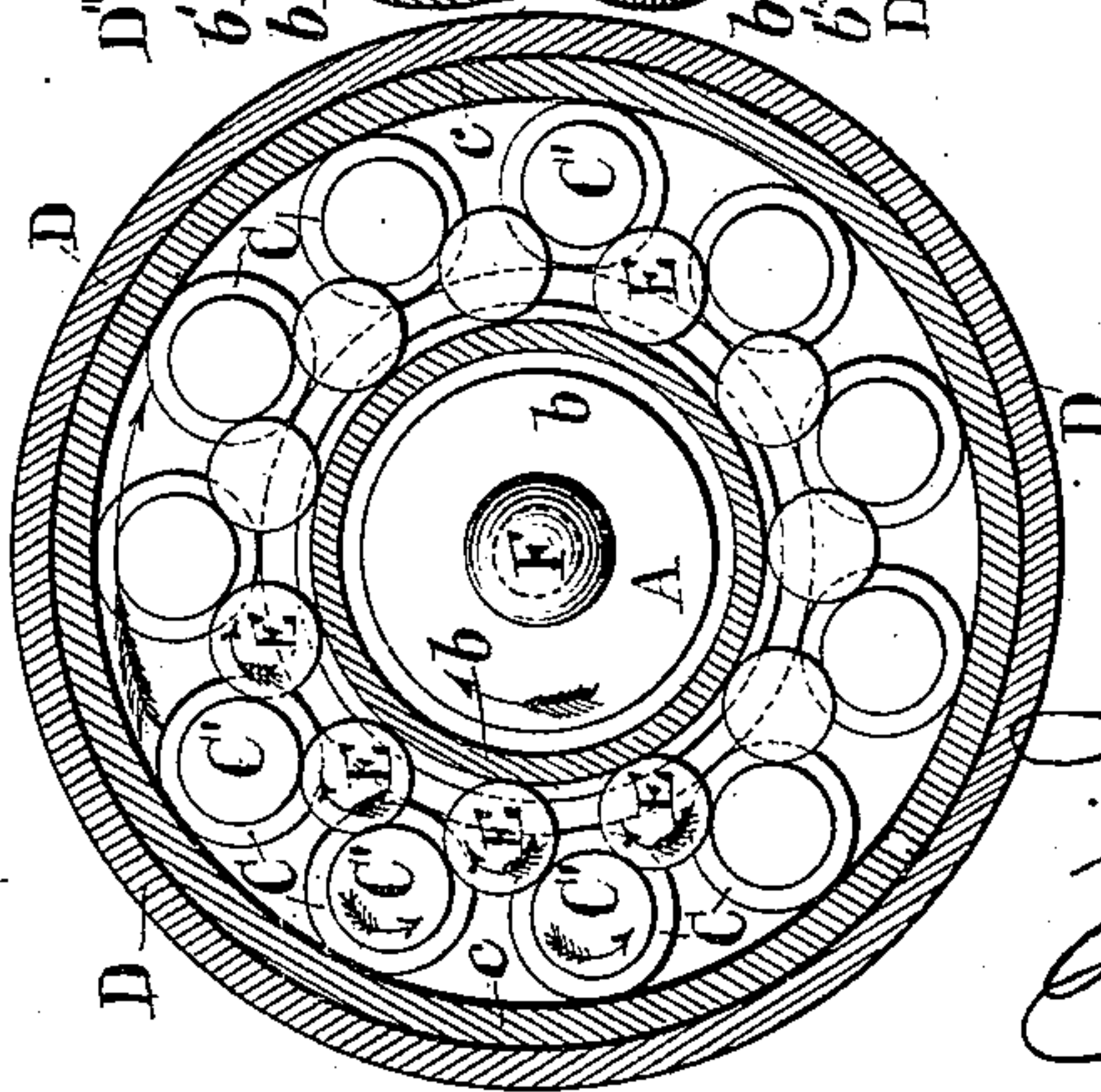


Fig. 2.



Witnesses:-

Louis M. F. Whitehead.

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Inventor:

A. W. Hall  
by his Attorney,  
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# UNITED STATES PATENT OFFICE.

A. WILFORD HALL, OF NEW YORK, N. Y.

## ANTI-FRICTION JOURNAL-BOX.

SPECIFICATION forming part of Letters Patent No. 304,523, dated September 2, 1884.

Application filed July 31, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER W. HALL, a citizen of the United States, and a resident of the city and county of New York, in the State of New York, have invented a new and useful Improvement in Anti-Friction Journal-Boxes, of which the following is a specification, reference being had to the accompanying drawings.

The invention consists, essentially, in the combination, with a shaft or axle and a journal-box having an interior concave surface, and fitted at either end with a cap consisting of a disk, upon the interior whereof is formed a hollow cylinder, of a cylindrical sleeve mounted on said shaft or axle, to move therewith within said box, a series of longer rollers supporting said sleeve and shaft or axle by rolling between the exterior surface of said sleeve and the interior surface of said box, and two series of shorter rollers, one series at each end of the said longer rollers, retaining the same in place by rolling between the latter rollers and the outer surface of the cylinders of said caps.

The invention further consists in certain details of construction hereinafter described.

Figure 1 is a longitudinal sectional view of part of axle fitted with an anti-friction journal-box constructed according to my invention. Fig. 2 is a transverse sectional view of the same on the line *xx* of Fig. 1.

Similar letters of reference denote corresponding parts in both the figures.

A denotes the axle; B, the cylindrical sleeve mounted on said axle and running with it.

C designates a series of cylindrical rollers surrounding the said sleeve B, and constructed with short journals C'.

D indicates the box, which has within a concave cylindrical surface of such diameter as to allow the rollers C C to revolve freely within it between it and the said sleeve as they are carried round by rolling contact with the exterior surface of said sleeve.

D' and D'' denote the caps of said box, which consist each of a disk, on the interior of which are formed two hollow cylinders, *b c*, arranged concentrically one within the other. One of these caps, D', has only a comparatively small

hole in the middle of its head or disk to accommodate the screw G. The other, D'', has a larger hole, through which the axle A passes into the box.

The exterior of the outer cylinder, *c*, is provided with a male screw-thread, to accommodate a female screw-thread in the end of the box, as illustrated by *c' c''*. The interior of this outer cylinder is a plain cylindrical concave surface of shorter diameter than the interior surface of the box, so that when the said cap is in its place there will be a shoulder at *c'* to restrain the rollers C from moving endwise. The interior of the inner cylinder of said cap is a plain concave cylindrical surface. The exterior surface thereof is also cylindrical, but has a wide groove extending from the shoulder *b'* to the shoulder *b''* cut all around it. The bottom of this groove is a convex cylindrical surface. In this groove revolve a series of short rollers. (Designated by E.) These short rollers retain the longer rollers C in place at proper distances apart by rolling between their journals C' and the convex cylindrical surface at the bottom of said groove, as illustrated in section in Fig. 2. The shoulders at *b'* and *b''* restrain the said rollers E from moving endwise.

To prevent any end slip of the axle A, the pin F, having a hemispherical head, is inserted into the end of the axle, and opposite to it in the head of the cap D' is placed a screw, G. By means of two such screws G, applied one to the outer cap of each of the two journal-boxes of an axle, and two such pins F, one in each end of the axle, the movement of the axle lengthwise is restrained without any appreciable friction.

When the parts of this box are to be put together, it is to be done as follows: First, the short rollers E are placed in the cap D''. This cap is then screwed into one end of the box, leaving the other end open. The rollers C are then inserted from the open end of the box, so that the short rollers E will hold their journals the proper distance apart in this cap. The sleeve B is then put in from the open end of the box between the rollers C. The cap D' is then screwed into the open end of the box, and, lastly, the short rollers E are inserted into



the cap D' through the opening at H, provided for that purpose, which may then be closed with a screw-plug, or in any other way which may be found convenient. When the parts  
5 are thus put together, the sleeve holds the rollers in place, so that convenience and facility are afforded for the placing of the box on the shaft or axle, or the placing of the shaft or axle within the box. This sleeve may fit the  
10 axle snugly. It will not turn thereon, but turn therewith, because there will be greater friction between the axle or shaft and the sleeve than between the sleeve and the rollers.

My invention is applicable to all places  
15 where anti-friction bearings are used to support the journals of revolving machinery.

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

1. In an anti-friction bearing, the combination,  
20 with the shaft or axle and a journal-box having an interior concave cylindrical surface and caps fitted one into each end of said box, each consisting of a disk having formed on the interior thereof a hollow cylinder, and a cylindrical sleeve mounted on the shaft or axle to  
25 move therewith within said box, of a series of longer rollers supporting said sleeve and shaft or axle by rolling between the exterior surface of said sleeve and the interior surface of said  
30 box, and two series of shorter rollers, one series at each end of the said longer rollers, retaining the same in place by rolling them and the exterior surfaces of the cylinders of said caps, substantially as and for the purpose  
35 herein described.

2. The combination, with the shaft or axle and the journal-box having the interior concave cylindrical surface and caps fitted one

into each end of said box, and each having formed on its interior two hollow concentric  
40 cylinders, and a cylindrical sleeve mounted on said shaft or axle to move therewith, of a series of longer rollers supporting said sleeve and shaft or axle within said box, and kept in place lengthwise by the end of the outer  
45 one of said cylinders, and two series of shorter rollers running in the groove in the exterior of said inner cylinder, and serving as bearings for the longer rollers, substantially as herein described.

3. The combination, with the shaft or axle and the journal-box having the interior cylindrical surface and caps fitted one into each end of said box, each having formed on its interior a hollow cylinder the exterior of which  
55 is grooved externally, and a cylindrical sleeve mounted on said shaft or axle to move therewith, of a series of longer journaled rollers supporting said sleeve or axle in said box, and two series of shorter rollers running in the  
60 groove in the exterior of said inner cylinder, and serving as bearings for the journals of the longer rollers, substantially as herein described.

4. The combination of the box D, the shaft  
65 or axle, the sleeve B, the caps having the internal hollow cylindrical projections, *b c*, the former of which has a groove, *b' b''*, the journaled longer rollers C C, and the shorter rollers applied within the grooves *b' b''* and between the journals of the longer rollers, all  
70 substantially as and for the purpose described.

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Witnesses:

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