

No. 738,096.

PATENTED SEPT. 1, 1903.

C. J. CALEY.
BALL BEARING KNOB SHANK.
APPLICATION FILED APR. 25, 1903.

NO MODEL.

Fig. 1.

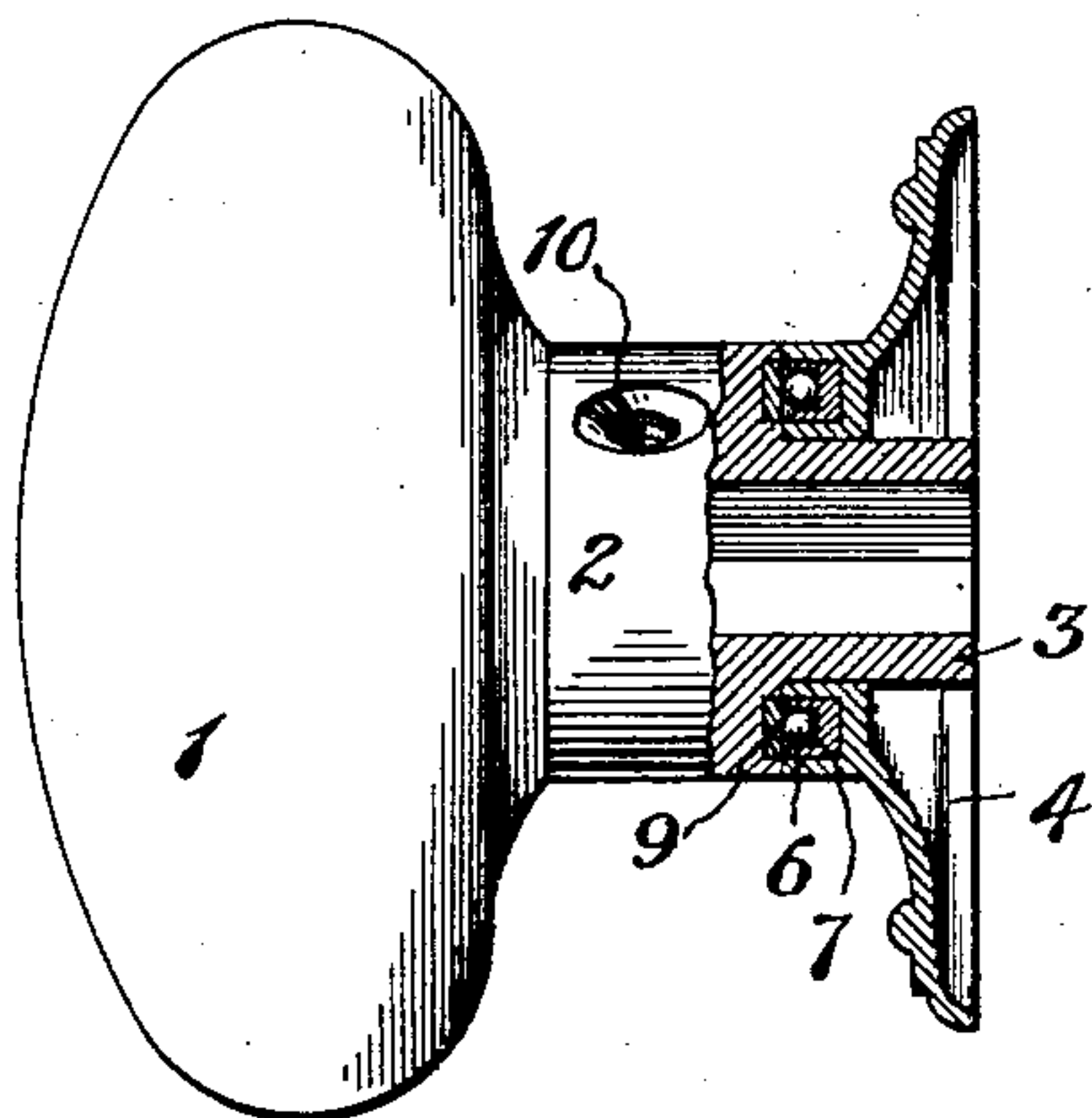


Fig. 2.

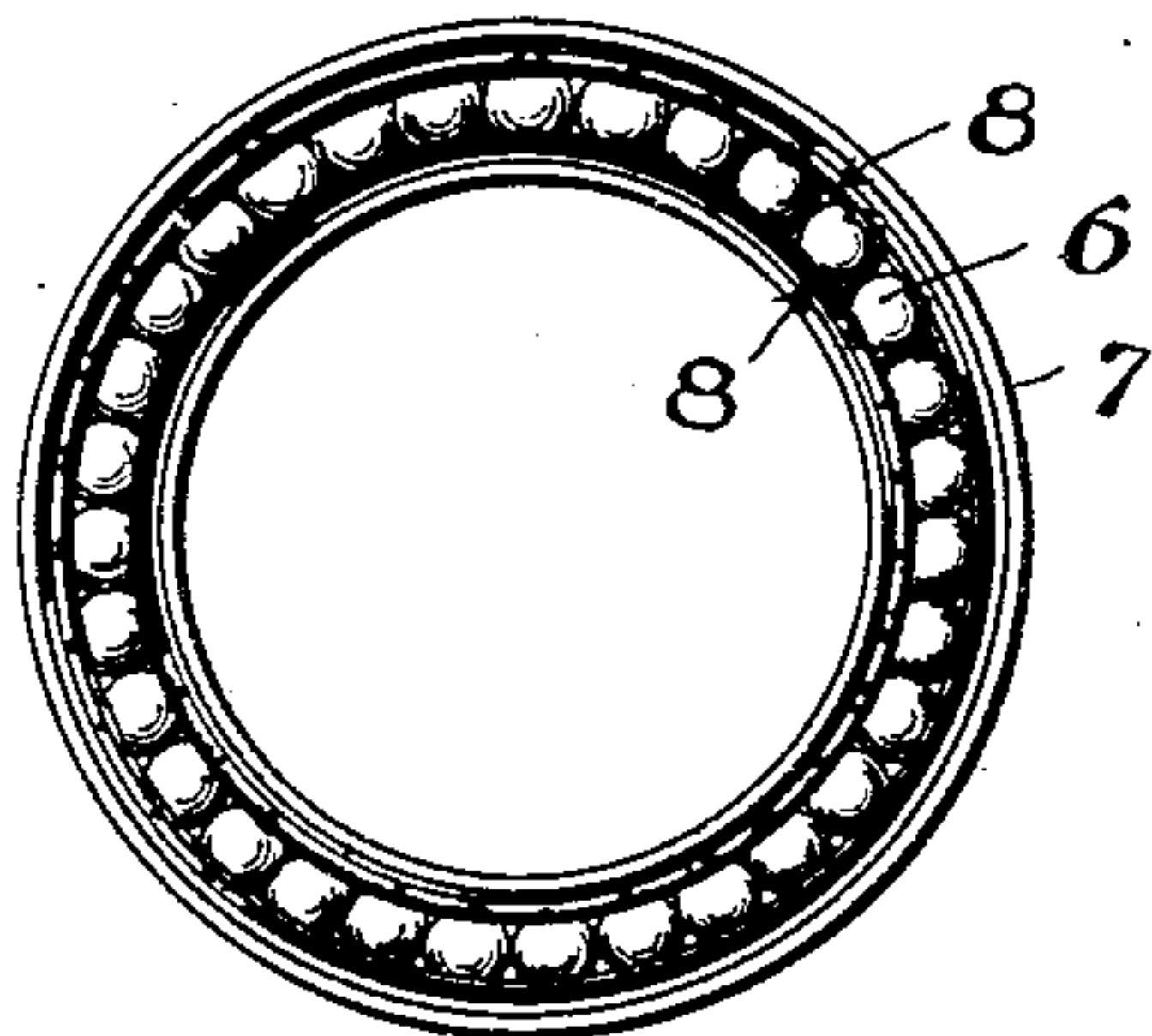


Fig. 3.

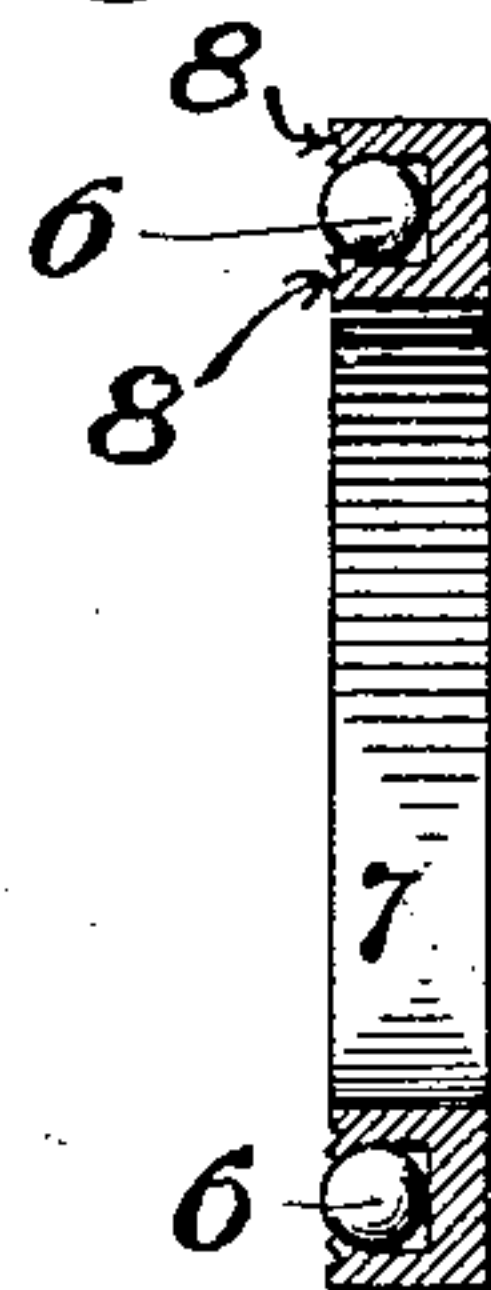


Fig. 4.

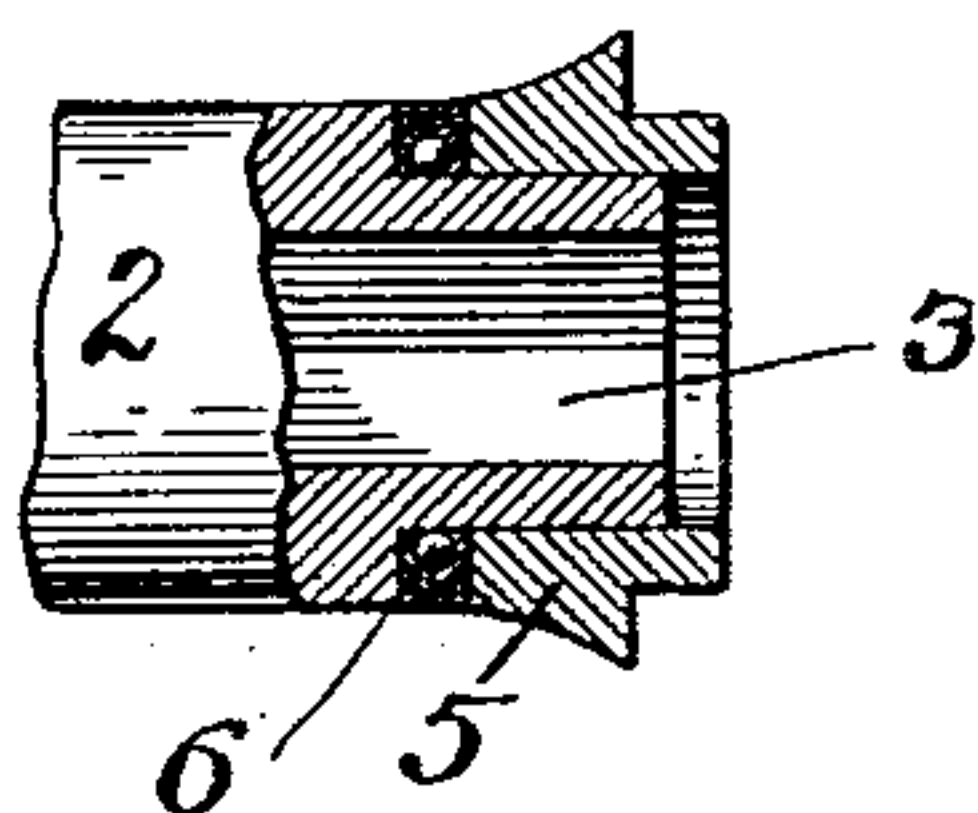
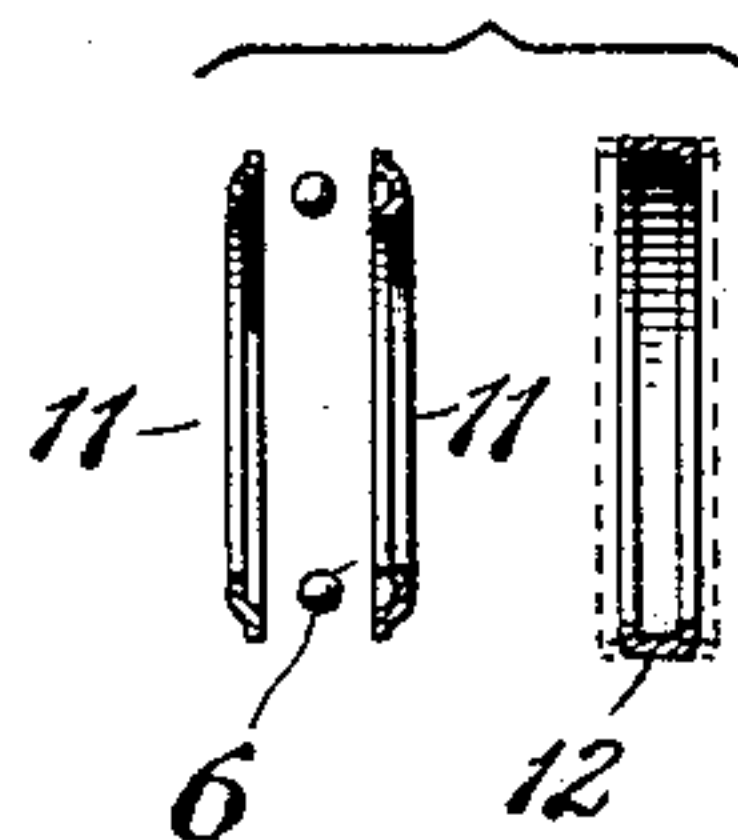


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

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BALL-BEARING KNOB-SHANK.

SPECIFICATION forming part of Letters Patent No. 738,096, dated September 1, 1903.

Application filed April 25, 1903. Serial No. 154,238. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. CALEY, a citizen of the United States, residing at New Britain, Hartford county, Connecticut, have
5 invented certain new and useful Improvements in Ball-Bearing Knob-Shanks, of which the following is a full, clear, and exact description.

My invention relates to improvements in
10 locks and latches, and particularly to an improvement in the knob-shank bearing.

The object of my invention is to improve the construction of the bearing for a door-knob shank, having in view economy of construction, freedom of action, and durability.
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In the accompanying drawings, Figure 1 is a side elevation of a door-knob, a portion of the shank and its bearing in the rose-plate being shown in section. Fig. 2 is an end elevation of a detached detail of construction.
20 Fig. 3 is a vertical section of the parts shown in Fig. 2. Fig. 4 is a view, partly in section, of a modification somewhat reduced in size. Fig. 5 illustrates details of construction of the modified form of Fig. 4.
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1 is a door-knob; 2, a knob-shank. 3 is a reduced portion or extension of said shank, which is adapted to project through a passage in a rose-plate 4, Fig. 1, or a thimble 5, Fig. 4.
30 In the form shown in Fig. 1 a series of anti-friction-balls 6 is located between the shoulder on the knob-shank adjacent the reduced portion and the end of the rose-plate 4. These balls may be carried by a suitable holder 7—for example, an annulus having a cavity in one face thereof forming a ball-race. When the balls are inserted in the race, the edges of the metallic wall may be grooved, as shown at 8 8, or sprung inwardly to slightly overstand
40 the balls, as best seen in Figs. 2 and 3, and retain the same in place. It will be seen that the depth of the ball-race is slightly less in diameter than the balls. Hence the latter will project slightly out of the race, so as to take a bearing against the shouldered end of the knob-shank 2 or a bushing 9, carried thereby. It will be observed that when the parts are assembled any tilting of the knob-shank or twist or end thrust will be received directly
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by the balls, so that friction will be reduced
50 to the minimum and the shank will not cramp or bind. The usual spindle may be provided and is arranged to pass through the usual cavity in the knob-shank and to be retained therein in any well-known manner—for example, by a screw which may pass through a screw-hole 10.
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If desired, the cavity for receiving the holder 7 might be formed in the shouldered portion of the knob-shank 2 instead of in the
60 end of the rose-plate. This would be a mere reversal.

In the modification of Figs. 4 and 5 a thimble 5 is shown as the bearing member instead of a rose-plate, such as shown in the previous figures. Instead of forming a cavity in the end of the thimble 5 to receive the ball-holder 7 the end of the said thimble is left flat or unchanneled, and between this end and the shoulder on the knob-shank 2 the anti-friction-balls are located. The balls are indicated at 6 and are held in place by means of a suitable retaining device, which may comprise a pair of annular rings 11 11, having suitable annular grooves to receive the balls.
75 These rings 11 11 may be held against accidental separation by a ring 12, the edges of which may be turned in to loosely embrace the said rings 11 11, as best seen in Fig. 4. This construction will permit the rings 11 11
80 to move independently, since they each form a track for the anti-friction-balls. At the same time they are held sufficiently close together to prevent the balls from dropping out. In Fig. 5 the several details of this ball-holder
85 are shown, and it will be observed that the retaining-ring 12 is shown in solid lines in its final form, while the dotted lines show it in its original form before the edges are turned down to clasp the rings 11 11. When these
90 parts are assembled, it will be seen that, as in the former case, any twisting or tilting of the knob-shank will be received by the anti-friction devices directly and frictional resistance reduced to a minimum. The ring 12 may
95 be made of a diameter corresponding to the diameter of the knob-shank, if desirable, and may also be formed of the same metal. Hence

while the antifriction-bearing will not be entirely hidden, as in Fig. 1, nevertheless it will be inconspicuous. The usual knob-spindle is provided in this case as in the other cases, said spindle being arranged to enter the knob-shank in the usual way and to be secured therein by any well-known means of fastening, which may be a screw connection, such as described in reference to Fig. 1. The means of fastening the spindle to the knob is of course immaterial in both cases.

What I claim is—

1. In a door lock or latch, a knob-shank, a tubular support therefor, the end of the shank being reduced and entering said support and forming a shoulder on the knob-shank, and a detachable antifriction-washer arranged between said shoulder and the end of said sup-

port, said washer being provided with antifriction-balls.

2. A door-knob construction including a knob-shank, an extension therefrom, a relatively stationary support surrounding said extension, a ball-holder surrounded and carried by and supported in but formed separately from the support, a series of balls carried by and retained in said holder, said series of balls coacting with the adjacent walls for taking up the end thrust of the knob and forming bearings therefor.

Signed at New Britain, Connecticut, this 23d day of April, 1903.

CHAS. J. CALEY.

Witnesses:

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