Nov. 11, 1924. 1,515,164

H. E. NORWOOD

ROTATABLE HANDLE CONSTRUCTION

Filed July 13, 1920

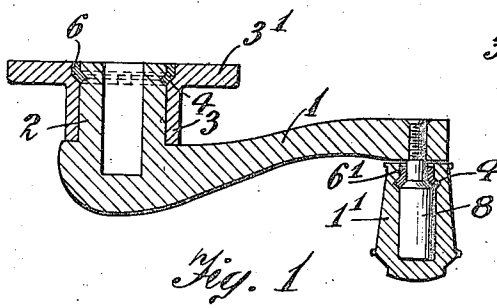


Fig. 1

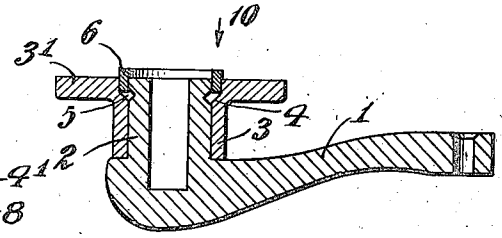


Fig. 2

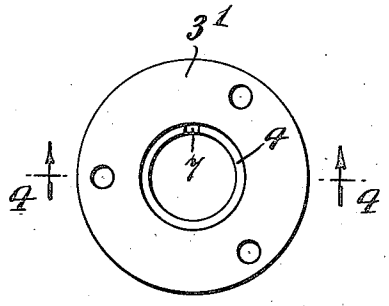


Fig. 3

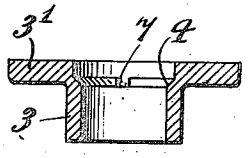


Fig. 4

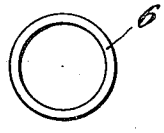


Fig. 5

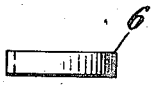


Fig. 6

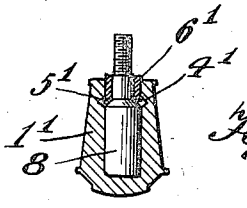


Fig. 7

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UNITED STATES PATENT OFFICE.

HARRY E. NORWOOD, OF NEW YORK, N. Y., ASSIGNOR TO PERFECT WINDOW REGULATOR COMPANY, OF NEW YORK, N. Y., A CORPORATION OF MAINE.

ROTATABLE HANDLE CONSTRUCTION.

Application filed July 13, 1920. Serial No. 395,910.

To all whom it may concern:

Be it known that I, HARRY E. NORWOOD, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Rotatable Handle Constructions, of which the following is a specification.

My invention relates to rotatable handles and more particularly to the means for securing said handle in or on its bearing to hold it against detachment by end movement while at the same time permitting free rotation and without the use of screws, nuts or similar fastening devices.

The invention consists essentially in providing one member of the device (the handle or its bearing) with a groove and the other or co-operating member with an inclined shoulder and in securing the two members against end movement with relation to one another by using an interlocking ring of malleable or soft metal engaged with said groove and inclined shoulder by applying suitable de-forming force as pressure to said interlocking ring to cause the soft metal ring to be deformed by engagment with the inclined and to be forced thereby into engagement with the groove in the opposite member where it is retained in its de-formed condition owing to the nature of the material of which it is composed.

When the parts are thus fastened together by said ring the handle is free to rotate but owing to the interlocking engagement of the ring with the shoulder and the groove on said members respectively, the handle may not be moved endwise to detach it from its bearing or support.

The invention further consists in details of construction in which the invention is preferably embodied as will be hereinafter more particularly described and then specified in the claims.

As will be hereinafter made apparent, the invention is applicable to any form of handle adapted to rotate and I have herein shown it as applied both to a crank handle and to a knob forming a handle on the crank.

In the accompanying drawings:

Fig. 1 is a central section through a construction embodying my invention and showing it applied to a crank handle and to a knob forming a handle on the crank.

Fig. 2 shows the parts as assembled preparatory to the application of pressure to deform the malleable interlocking ring and secure the rotatable member against detachment from its bearing.

Fig. 3 shows in plan the member forming the bearing in which the crank handle is socketed, looking from the rear side of said bearing.

Fig. 4 is a central section on the line 4—4 Fig. 3.

Fig. 5 is a plan of a malleable or deformable interlocking ring forming the blank ring which by pressure becomes the interlocking ring.

Fig. 6 is a side elevation of said ring and

Fig. 7 shows a knob forming a handle on the end of the crank with the co-operating parts assembled ready for pressing the interlocking or fastening ring into interlocking position.

1 indicates the crank handle of any desired form and used for imparting rotation to any suitable device engaged therewith by a squared opening to receive a spindle operated device. 2 is a boss or projection of the crank arm or handle 1 which boss is adapted to turn in a socket 3 forming a bearing therefor and projecting from the plate or escutcheon 3′ by which the handle may be secured in position upon the face of a door or other object as well understood in the art.

The bearing 3 in the form of my invention illustrated in Figs. 1 and 2 is countersunk from the rear to provide at the base of the countersink the incline indicated at 4 which, when the handle or rotatable member of the device is in permanent position, will be located opposite a groove formed preferably around the whole periphery of the boss 2 clearly shown in Fig. 2.

The interlocking malleable ring by which the parts are secured together is indicated at 6. This ring may be of any suitable soft metal adapted to be deformed by engage-

ment with the incline 4 when pressure is applied in the direction of the arrow 10 and to be thereby forced sidewise into the groove 5 in the boss, so that in the finished device the ring will occupy the position indicated in Fig. 1 and the handle will be effectually held by said ring against withdrawal from its seat or bearing but will at the same time be free to rotate therein.

In the preferred way of carrying out my invention means are provided to secure the ring itself against rotation so that the inner surface of said ring will constitute a bearing upon which the boss will then turn. To effect this result the incline 4 at the bottom of the countersink in the member 3 may be provided at a portion of its circumference with a nick or offset indicated at 7 with the edges of which the soft metal ring will be caused to interlock when it is pressed downwardly and so that the said ring will be held from turning circumferentially. By thus locking the ring 6 against rotation, any slight eccentric action between the rotating parts will not cause the ring to lock the boss 2 against rotation in its bearing 3. If desired a plurality of offsets 7 may be spaced around the inclined surface 4.

In the case of the boss of the crank handle I have shown my invention as embodied in a structure wherein the bearing for the handle is an internal bearing. As illustrated, however, in the case of the knob 1′, the bearing is an external bearing upon a pin 8 suitably fastened to the end of the crank handle, as shown, by the reduced end of the pin, said pin however forming a bearing for the knob 1′ and being provided, as indicated, with the inclined shoulder 4′ upon its periphery located opposite to an internal groove 5′ within the knob 1′. The locking ring of malleable metal 6′ is forced by end pressure applied when the parts are in position shown in Fig. 7, into the position indicated in Fig. 1 by engagement with the inclined shoulder. The interlocking ring being located between the shoulder and the groove on the two members respectively of the handle, holds said knob or handle 1′ against detachment although it is free to rotate on its bearing 8. In this instance it is preferable to hold the inner end of the knob 1′ slightly away from the surface of the crank arm 1 to avoid frictional engagement between the parts. This may readily be done by providing a shoulder on the pin 8 which projects slightly beyond the inner end of the knob 1′ and seats against the surface of the crank arm.

Similar means to that already described may be employed, if desired, to prevent the turning of the ring although in this instance it may be left free to rotate with the knob 1′ as a rotatable portion thereof. said ring in this instance turning upon the reduced portion of the pin as a bearing while the main portion of the knob 1′ turns upon the larger part of said pin.

By this arrangement of locking the parts together by the locking ring 6 or 6′, they may be secured as freely or snugly as desired according to the degree of driving the ring in place and should the parts wear too loose they can be readily tightened by merely driving the ring further down.

What I claim as my invention is:—

1. Means for holding a rotatable handle to its bearing or support while permitting free rotation thereof, comprising an interlocking ring of malleable metal engaged with a shoulder on one member and with a groove opposite said shoulder on the other member, said interlocking ring being held against rotation by inter-engagement with a nick or offset in the non-rotating member.

2. The combination of a rotatable handle and a bearing socket therefor countersunk at its rear and provided at the bottom of the countersink with an incline for engagement by a locking ring of malleable metal engaged by pressure with a groove in the rotatable member opposite said incline while permitting free rotation of said handle in said socket.

3. The combination with a crank handle, of a bearing socket in which the boss of said handle is adapted to rotate, said socket being provided at its rear with a countersink having an incline at its bottom and said boss being provided with a groove opposite the incline and locking ring of malleable metal forced by pressure within said countersink and groove.

4. The combination with a rotatable crank handle having a boss, of a socketed piece forming an external bearing for said boss, said socketed piece having a countersink on its rear provided with an incline at the bottom of the countersink and a locking piece of metal forced by pressure into engagement with the incline and with a groove or depression in the boss.

5. The herein described method of securing a knob or handle against detachment from its bearing but permitting free rotation thereof, consisting in providing one of said members with a groove, providing the other member with an inclined surface opposite said groove, applying a continuous malleable ring of soft metal in the space between the members and in engagement with the incline and applying pressure to deform the metal ring by engagement with the incline and force it into said groove, thereby interlocking the rotatable handle and bearing against detachment while leaving the one free to rotate upon the other.

6. The herein described method of securing a knob or handle against detachment from its bearing but permitting free rota-

tion thereof, consisting in providing one of said members with a groove, providing the other member with an inclined surface opposite said groove, applying a locking piece of metal in the space between the members and in engagement with the incline and applying pressure to deform said locking piece by engagement with the incline and force it into said groove thereby interlocking the rotatable handle and bearing against detachment.

Signed at New York, in the county of New York and State of New York this 12th day of July A. D. 1920.

HARRY E. NORWOOD.

Witnesses:

ALBERT S. BROWN,

M. O. MUELLER.