

(No Model.)

F. H. RICHARDS.
KNOB ATTACHMENT.

No. 562,419.

Patented June 23, 1896.

Fig. 1

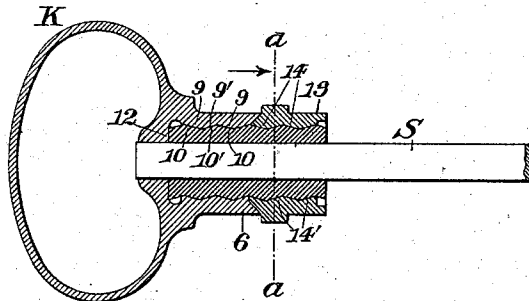


Fig. 2

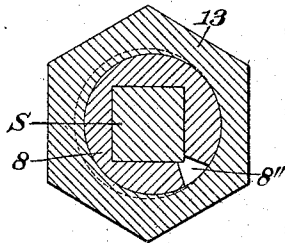


Fig. 3

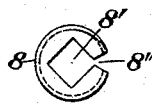


Fig. 4

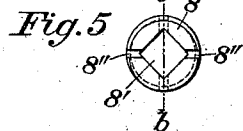
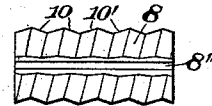


Fig. 6

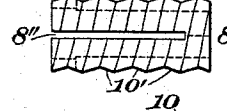


Fig. 7

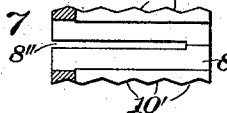


Fig. 8

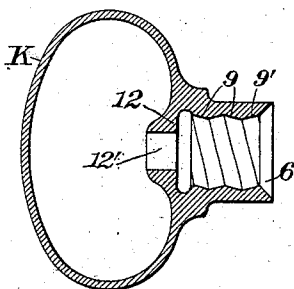


Fig. 9

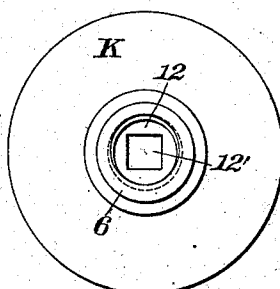
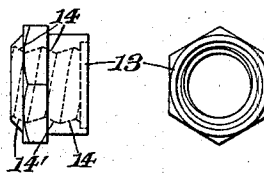


Fig. 10

Fig. 11



Witnesses:

Wm. Byrckman,
Fred. J. Dole.

Inventor:

F. H. Richards

UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT.

KNOB ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 562,419, dated June 23, 1896.

Application filed October 17, 1894. Serial No. 526,130. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Knob Attachments, of which the following is a specification.

This invention relates to that class of fastening devices or couplings adapted for removably securing hubs, knobs, and like parts to spindles or similar rods by means of frictional clamping devices; and it has for its object to provide a simple and powerful coupling in which a compressible member or divided clamping-sleeve is adapted to be held in rigid engagement with a spindle or similar rod by means of a wedging force exerted directly upon said clamping-sleeve by a controlling and locking device, and exerted reactively upon said clamping-sleeve by a resistance member coöperating with the clamping-sleeve and with the controlling and locking device.

My present invention is in the nature of an improvement upon that shown and described in my Patent No. 530,624, dated December 11, 1894.

In the drawings accompanying and forming a part of this specification, Figure 1 is a vertical longitudinal section of a door-knob furnished with my present improvements, the usual squared spindle being shown in side elevation. Fig. 2 is a transverse section, on an enlarged scale, taken in line *a a*, Fig. 1. Fig. 3 is an end view of the divided clamping-sleeve. Fig. 4 is a side elevation of the same. Fig. 5 is an end view of a modified form of the clamping-sleeve. Fig. 6 is a side elevation of the same. Fig. 7 is a longitudinal section of the same, taken in line *b b*, Fig. 5. Fig. 8 is a central longitudinal section of the door-knob and the resistance member carried thereby. Fig. 9 is a rear elevation of the same. Fig. 10 is a side elevation of the controlling and locking collar-nut for securing the knob and the clamping-sleeve to the spindle. Fig. 11 is an end elevation of the same.

Similar characters designate like parts in all of the figures.

The spindle S is shown in the drawings as

having the usual squared cross-sectional form, of uniform area throughout the length thereof.

The door-knob (designated in a general way by K) is shown as formed with a hub or stem 6, having a longitudinal opening of considerably greater diameter than the diameter of the spindle, and as also provided with the stop wall or shoulder 12 at the inner end of said opening, a central smaller squared opening, as 12', preferably connecting the bore of said stem with the hollow knob, and being adapted to engage the sides of the end of the spindle S snugly. The bore of the stem 6 is shown herein as formed with a suitable number of inclined or wedge-like bearing-faces or steps 9 and 9', alternating in the direction of their inclination, the plane of one bearing-face 9 spirally coinciding with the planes of the other faces of like inclination, so that the said faces form together a continuous inclined spiral path or thread, while the faces 9' also have their planes coinciding in spiral direction at an inclination to the adjacent bearing-faces 9. These internal bearing-faces of the stem are adapted to be engaged by similarly-formed external bearing-faces 10 and 10', formed upon the thimble or clamp-sleeve 8. This clamp-sleeve is shown herein as having a central longitudinal bore 8', of rectangular outline, adapted to receive the spindle S and slide thereon freely but closely. This clamping-sleeve is also shown herein, in Figs. 3 and 4, as provided with a longitudinal slit 8'', preferably at one of the angles of said opening in the sleeve, so as to permit compression of the walls thereof. In Figs. 5, 6, and 7 this sleeve is shown as having slits 8'' extending longitudinally of the sleeve along all of the angles of the opening 8', two of said slits being shown as extending part way through said sleeve from one end and the other slits reaching part way through the sleeve from the opposite end, so as to divide said sleeve into a plurality of segments capable of yielding transversely in all directions. This clamping screw or thimble is adapted to be screwed into the stem or resistance member of the knob, so that the end thereof will engage the abutment 12 of the knob before the spindle S is inserted into the longitudinal bore 8' of said clamping member, as it is evident that,

when the spindle is in position, the clamping-sleeve cannot be turned relatively to said knob.

As a means for securing the clamping-sleeve in rigid engagement with the spindle S, so as to prevent longitudinal as well as lateral movement of the parts, a controlling and locking device, shown herein as a clamping or collar nut 13, having oppositely-inclined internal threads or bearing-faces 14 and 14', corresponding with the threads or bearing-faces 9 and 9' of the stem or resistance member 6 of the knob, is provided; hence these threads of the collar-nut also are adapted to engage the corresponding threads or bearing-faces 10 and 10' of the thimble or clamping-sleeve 8 and to cooperate therewith to lock the sleeve to the spindle.

In assembling the parts the compressible member or sleeve 8 is first screwed into the resistance member or stem 6 of the knob, as before described, until the end thereof engages the abutment 12, and the collar-nut is then screwed onto said clamping-sleeve until it abuts against the end of the stem, when the spindle S is inserted into the sleeve 8. If now the nut 13 is further rotated in the same direction, (usually by means of a wrench,) the abutment of the collar-nut against the end of the stem will prevent further longitudinal movement of said nut, and will cause the bearing-faces 14' to ride up the adjacent corresponding faces 10' of the sleeve, and thereby compress the yielding walls of the sleeve and reduce the area of the bore therein, whereby the walls of said bore are caused to take a firm hold upon the sides of the spindle. It will be seen that the wedging action is produced entirely by the cooperation of the wedge-faces 10' and 14', and that there is no wedging action whatever between the bearing-faces 10 and 14, but that the said bearing-faces or threads 14 cooperate with the corresponding bearing-faces 9 of the knob-stem to prevent longitudinal movement of the clamping-sleeve with respect to said stem, whereby said stem is adapted to form a resistance member which holds the clamping-sleeve positively against longitudinal movement when the parts are assembled, while the constant tendency of the controlling and locking collar-nut 13 is to cause a relative longitudinal movement between said nut and the sleeve. This tendency toward longitudinal movement, when the nut is turned upon the sleeve, therefore causes the riding up of the bearing-faces 9' upon the opposed bearing-faces 14', thereby compressing the sleeve upon the spindle, and the reactive resistance of the sleeve, especially when it is in engagement and practically solid with the spindle, tends to force the bearing-faces 14' down the opposed bearing-faces 10', and thereby to hold the collar-nut in rigid longitudinal engagement with the knob-stem. The collar-nut and said stem are preferably provided with overlapping meeting faces, as shown

herein, whereby one of the parts forms a socket into which the other may take and thus form a very substantial and solid connection.

It will be observed that all of the bearing-faces lie at the same angle to the longitudinal axis of the member upon which they are formed, and that said bearing-faces are of about the same width, so that the sleeve 8 is reversible and may be assembled, relatively to the other parts, with either of its ends facing the abutment or shoulder 12 of the knob; hence, in either of the positions of said sleeve, the locking-nut and the stem will engage the bearing-faces of such sleeve properly, and the locking-nut will compress one end of the compressible member directly, relatively to said locking-nut, and reactively relatively to the stem.

The described organization of devices constitutes a very rigid, compact, and powerful coupling especially adapted for securing door-knobs to their spindles, and in which coupling the clamping effect, obtained by the coaction of the wedge-threads or bearing-faces which serve to compress the sleeve upon the spindle, is maintained by the locking of the parts against longitudinal movement by a right and left hand screw-thread action positively and perfectly maintaining the desired degree of tension upon the assembled parts.

Having thus described my invention, I claim—

1. In a coupling of the class specified, the combination with a resistance member having a wedge-bearing and having also a fixed stop, of a compressible member having a pair of wedge-bearings inclined oppositely to each other and one of which cooperates with said bearing upon the resistance member to compress said compressible member, and a locking device in longitudinal engagement with the stop upon said resistance member and having a wedge-bearing inclined oppositely to the wedge-bearing of the resistance member and cooperating with the other of the wedge-bearings upon the compressible member, said locking device being adapted to be turned to compress the compressible member relatively to said locking device and to the resistance member.

2. A door-knob having a tubular stem provided with a beveled stop adjacent to its outer end, and with an abutment adjacent to its inner end extending substantially at right angles to said stem, and also having oppositely-inclined internal wedge-bearings; a slitted compressible clamp-sleeve fitting into said tubular stem, and adapted to receive a door-knob spindle, and having external, oppositely-inclined bearings for cooperating with said bearings of the stem, and also having its inner end in engagement with said abutment; and a clamping-nut mounted upon said clamp-sleeve, and having a beveled end and internal, oppositely-inclined bearings for cooperating with the bearings upon the clamp-sleeve, and

adapted to be turned to have its beveled end engage the beveled stop, adjacent to the outer end of the stem, and thereby compress said clamp-sleeve relatively to said clamping-nut and to the stem.

3. A coupling comprising a resistance member; a compressible member having an undulatory face; and means for compressing said last-mentioned member upon the object to be held.

4. A coupling comprising a socketed member; a hollow slitted member having an undulatory face; and means for compressing the slitted member upon the object to be held.

5. A coupling comprising a socketed member; a hollow slitted member having an undulatory face inserted therein; and a sleeve for compressing the slitted member upon the object to be held.

6. In a coupling of the class specified, the combination with a resistance member having alternating oppositely-inclined wedge-threads substantially as described and having also a fixed abutment, of a reversible com-

pressible member having similar threads either set of which is adapted to cooperate with one set of similarly-inclined threads upon the resistance member and also having one end in engagement with said abutment, and a controlling and locking device in longitudinal engagement with the resistance member and having threads cooperating with either of the sets of threads upon the compressible member which set is not engaged by the aforesaid set of threads upon the resistance member, said controlling device being adapted to be turned to compress the compressible member relatively to said controlling device and to the resistance member in either of the positions of said compressible member whereby the compressible member may be assembled with either of its ends facing the aforesaid abutment upon the resistance member.

FRANCIS H. RICHARDS.

Witnesses:

FRED. J. DOLE,
M. D. CROWELL.