

(No Model.)

F. H. RICHARDS.
KNOB ATTACHMENT.

No. 562,420.

Patented June 23, 1896.

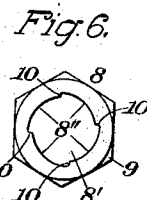
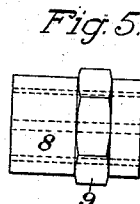
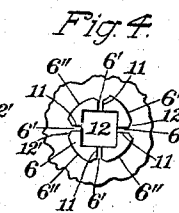
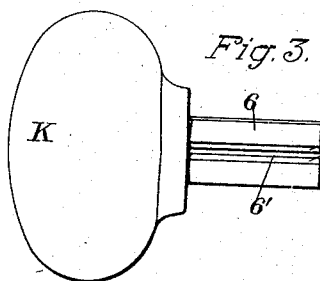
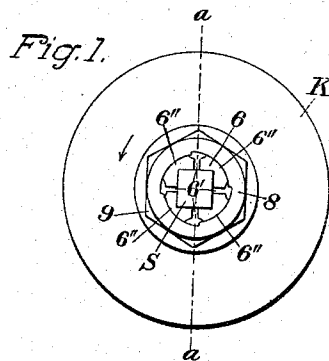
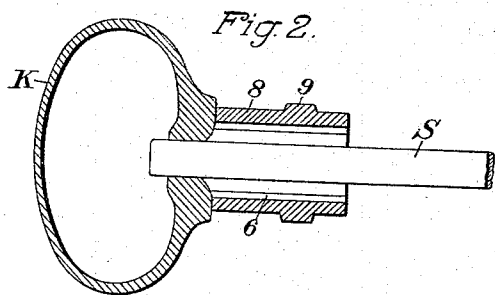


Fig. 7.

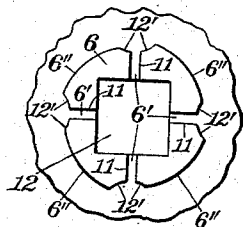


Fig. 8.

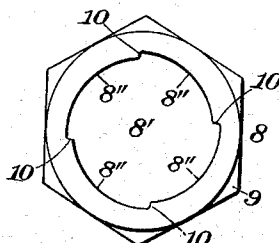


Fig. 9.

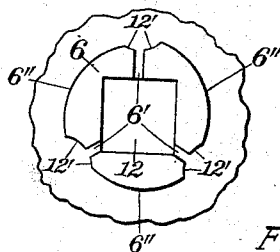


Fig. 10.

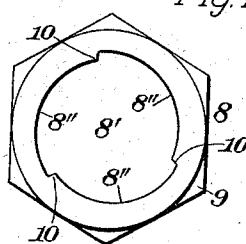
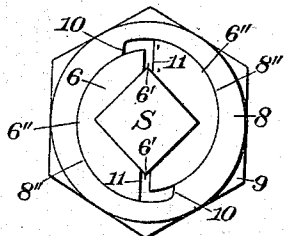


Fig. 11.



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UNITED STATES PATENT OFFICE.

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KNOB ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 562,420, dated June 23, 1896.

Application filed October 11, 1894. Serial No. 525,571. (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 couplings of that class adapted for securing hubs, knobs, and like parts upon spindles and similar carriers, the object being to furnish an improved connecting device of this general class in which a compressible member is adapted to be secured upon a carrier by a clamping action exerted by cam devices interposed between said compressible member and a resistance member cooperating therewith, and which cam devices act substantially transversely relatively to said members.

In the drawings accompanying and forming a part of this specification, Figure 1 is a rear elevation of a door-knob furnished with my present improvements and in operative relation with a cooperating knob-spindle. Fig. 2 is a central longitudinal section of the same in line *a a*, Fig. 1, the spindle being shown in elevation. Fig. 3 is a side elevation of the door-knob and the compressible stem secured thereto. Fig. 4 is a rear elevation of a portion of the same. Fig. 5 is a side elevation of a resistance member or clamping-sleeve cooperating with said compressible stem. Fig. 6 is an end elevation of the same. Fig. 7 is a rear elevation, on an enlarged scale, corresponding with Fig. 4. Fig. 8 is a similar view corresponding with Fig. 6. Fig. 9 is a rear elevation, on an enlarged scale, of a door-knob, illustrating a modification of the compressible stem. Fig. 10 is an end elevation, on an enlarged scale, of a modified form of clamping-sleeve adapted to cooperate with the compressible stem shown in Fig. 9. Fig. 11 is a rear elevation, on an enlarged scale, of a spindle, a compressible knob-stem, and a clamping-sleeve, illustrating another modification of my invention.

Similar characters designate like parts in all of the figures.

My present invention comprises, in combination with a spindle or similar carrier, a compressible member or stem mounted upon

the carrier and adapted to impinge the same, and having longitudinally-disposed and transversely-acting cam-faces, preferably formed upon portions of said compressible member or stem, and a resistance member or clamping-sleeve having reversely-formed, longitudinally-disposed and transversely-acting cam-faces adapted to cooperate with the corresponding cam-faces of the compressible member and to compress said member to lock the same to the carrier or spindle.

The spindle *S* is shown herein as of the usual squared cross-sectional form and of the same area of cross-section throughout its length. The door-knob *K* is also shown in Figs. 1, 3, 4, and 7 as having a stem 6, preferably integral with said knob and traversed longitudinally, preferably throughout the entire length thereof, by central transversely-disposed intersecting bifurcations or slits 6', which divide the stem or compressible sleeve into a plurality of wedge-pieces arranged around a common center and adapted to yield transversely toward and from said center to impinge against and hold a spindle or carrier mounted centrally of said stem. Each of these wedge-pieces or sleeve members is shown formed with a cam-face 6'', which cam-faces are similarly disposed relatively to the longitudinal axis of the carrier and have their longitudinal faces in parallelism with said axis. As a means for compressing the wedge-pieces of the stem 6 I have shown herein a solid sleeve or resistance member 8, having a longitudinal bore substantially corresponding in outline with the outline of the stem 6. The bore 8' of this clamping-sleeve is shown herein as provided with a plurality of cam-faces 8'', extending throughout the length of said bore and in parallelism with the longitudinal axis thereof. These cam-faces coincide in position and practically in extent with the cam members of the compressible sleeve 6 and are complementary thereto, being shown herein as described by curves which are arcs of equal circles, and which arcs are similarly disposed relatively to a common center. The resistance-sleeve 8 is shown as preferably provided with a nut 9, by means of which and a suitable wrench the clamping-sleeve may be adjusted to bind the compressible sleeve to the carrier upon which it is mounted.

In assembling the parts the resistance or clamping sleeve 8 is first slipped over the stem or compressible sleeve 6 of the knob by a longitudinal movement, the end walls 10 intermediate of the cam-faces 8'' being substantially in line with the faces 11 of the wedge-pieces comprising the compressible sleeve. The spindle S is then inserted into the squared central opening or bore 12 of the stem 6, which bore corresponds in outline with the outline of the spindle, and the stem 6 is then brought into rigid engagement with said spindle by turning the clamping or resistance sleeve in the direction of the arrow in Fig. 1. Upon the turning of the clamping-sleeve in said direction, the cam-faces 8'' thereof ride up the corresponding cam-faces 6'' upon the compressible sleeve, and thereby force the wedge-pieces inwardly toward the spindle and into engagement therewith. It will be understood that the range of movement of the clamping-sleeve to obtain this wedging action against the spindle is dependent upon the number of wedge-pieces into which the stem 6 may be divided. In the construction which has just been described, it will be obvious that the cam or wedging action of the complementary cam members might be effectively exerted throughout a quarter-turn of the clamping-sleeve.

In Figs. 9 and 10 I have shown the compressible stem as having three longitudinal slits 6', which divide the stem into three wedge-pieces, having a corresponding number of cam-faces 6''. In this construction it will be obvious that the clamping action would be effective, that is, it would continually increase during the turning of the clamping-sleeve through an arc of one hundred and twenty degrees.

In Fig. 11 another modification is shown in which the compressible stem has a single slit or bifurcation 6', extending longitudinally of the same, and that the clamping-sleeve is formed with two complementary cam-faces 8'', coöperating with the cam-faces 6'' of said stem. In this construction a progressive clamping action will be exerted throughout a half-turn of the clamping-sleeve.

In order to obtain the most perfect coaction of the complementary cam-faces of the clamping and compressible sleeves, I deem it preferable to remove a portion of the longitudinal faces of the wedge-pieces constituting the stem 6 at the points where the peripheral surface of the stem is intersected by the slits

6', as shown at 12', in order that no abutment may present itself to impede the action of the cam-surfaces of the clamping-sleeve.

By means of the described organization of the resistance and compressible members of the coupling relatively to the carrier or spindle upon which they are mounted, it will be evident that a very simple and effective securing device is obtained, by means of which the two sleeves may be brought into practically-rigid engagement with each other and with the carrier therefor.

Having thus described my invention, I claim—

1. A door-knob having an exteriorly-extending and longitudinally-slitted stem integral therewith, and forming transversely-yielding wedge-pieces, each of said wedge-pieces having an external and transversely-extending cam-face disposed throughout its entire length in a plane parallel with the longitudinal axis of the stem; a spindle adapted to be engaged by said stem; and a removable clamping-sleeve having similar complementary, internal, and transversely-extending cam-faces and adapted to be turned throughout its entire clamping movement in a plane perpendicular to the longitudinal axis of the sleeve-stem, to thereby cause the cam members to engage and transversely ride up the cam-faces of the wedge-pieces of the stem, and thereby compress said wedge-pieces against the spindle.

2. A coupling comprising a carrier having an exteriorly-extending and longitudinally-slitted compressible sleeve having cut-away portions adjoining the slits of said sleeve and having a plurality of transversely extending and acting cam members formed with their longitudinal faces in a plane parallel with the longitudinal axis of the compressible sleeve; and a removable resistance-sleeve having similar transversely extending and acting complementary and longitudinally-disposed cam members, and adapted to be turned throughout its entire clamping movement in a plane perpendicular to the longitudinal axis of the compressible sleeve, to thereby cause its cam members to engage and transversely ride up the faces of the complementary cam members of the compressible sleeve, and thereby compress said sleeve.

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