

No. 817,113.

PATENTED APR. 3, 1906.

E. HETHERINGTON.
HUB ATTACHING DEVICE.
APPLICATION FILED MAY 27, 1905.

2 SHEETS--SHEET 1.

Fig. 1.

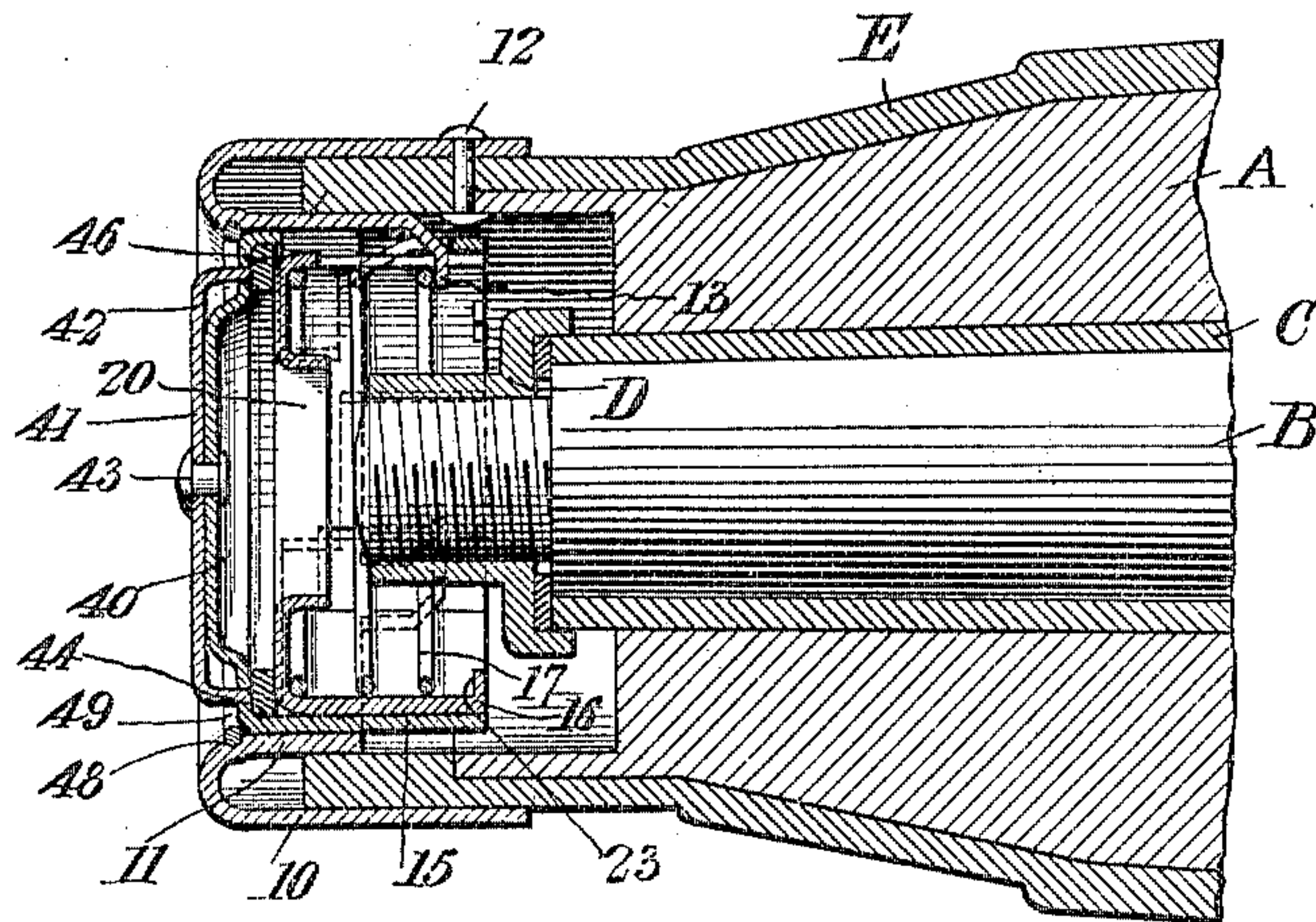
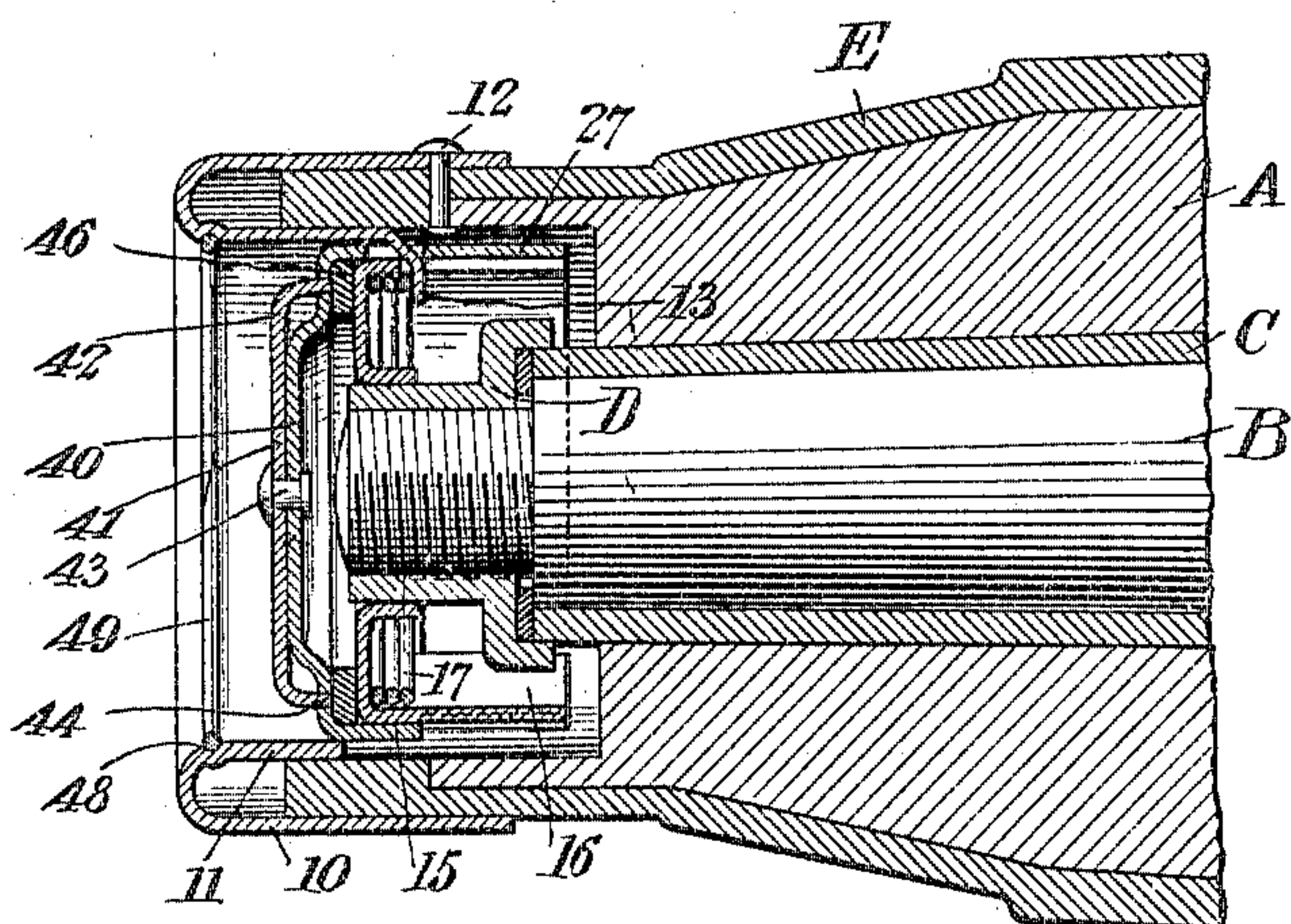


Fig. 2.



Witnesses

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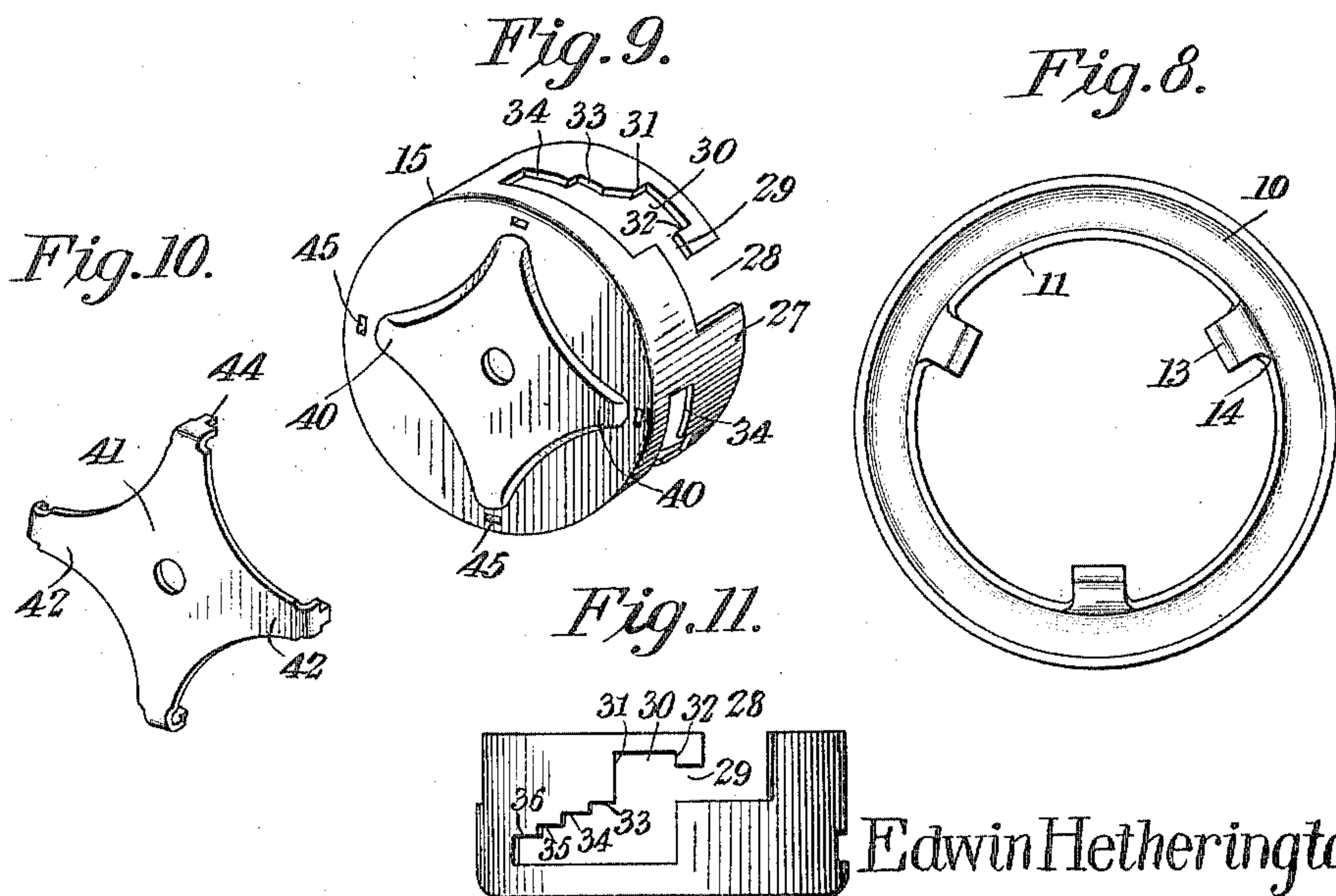
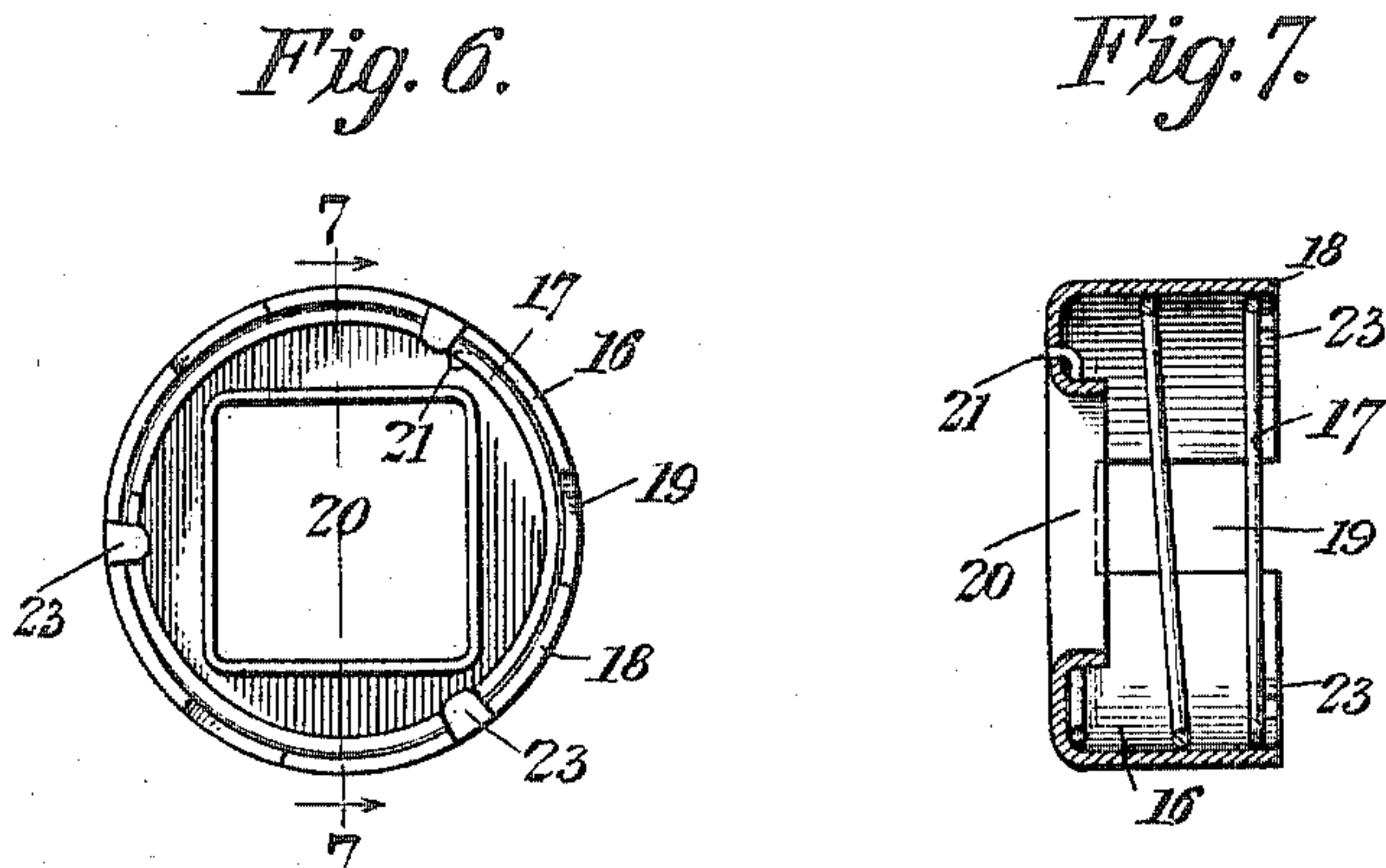
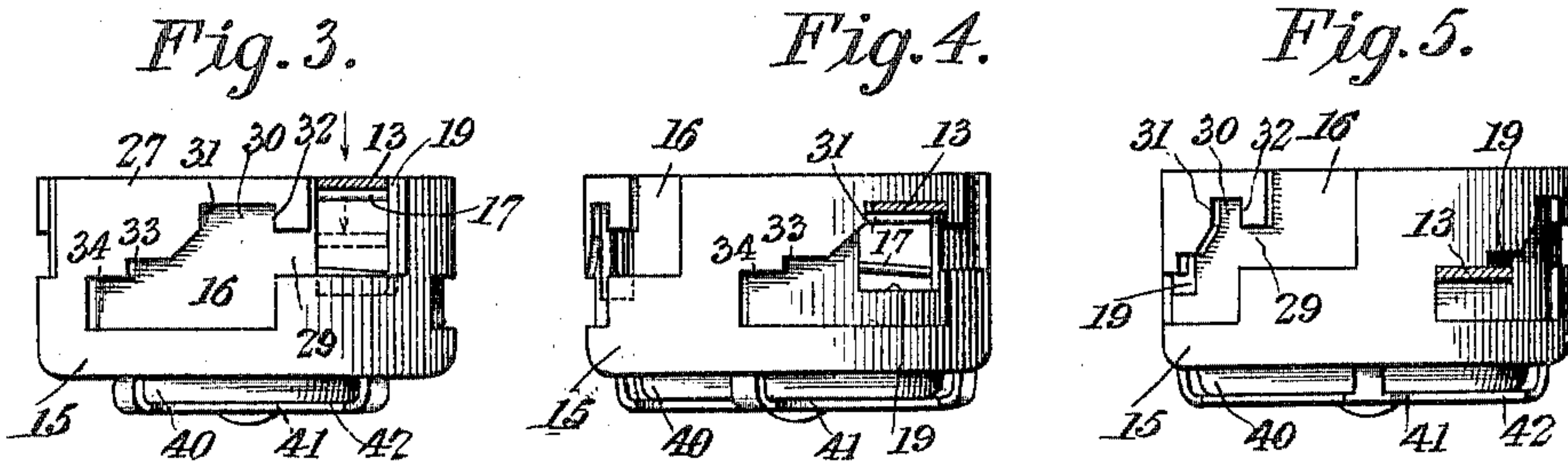
Attorneys

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UNITED STATES PATENT OFFICE.

EDWIN HETHERINGTON, OF CEDAR RAPIDS, IOWA.

HUB-ATTACHING DEVICE.

No. 817,113.

Specification of Letters Patent.

Patented April 3, 1906.

Application filed May 27, 1905. Serial No. 262,678.

To all whom it may concern:

Be it known that I, EDWIN HETHERINGTON, a citizen of the United States, residing at Cedar Rapids, in the county of Linn and State of Iowa, have invented a new and useful Hub-Attaching Device, of which the following is a specification.

This invention relates to hub-attaching devices of that class in which provision is made for connecting the wheel to the axle-nut in order to facilitate the removal of the latter.

One object of the invention is to provide a device of this character in which provision is made for effectually preventing the entrance of dust and dirt to the parts in frictional contact and to so construct the device that a portion of the dust-guard is also employed as a means for preventing accidental displacement of the connecting means between the wheel-hub and the nut.

A further object of the invention is to provide a device of this class which may be made and placed on the market as a separate article of manufacture and quickly applied to vehicle-hubs already in use without any changes in the construction of the hubs or other portions of the vehicle.

A still further object of the invention is to provide an attachment of this type which may be made of a standard size and adjusted before application to the hub to suit the construction of the hub, axle, nut, and other parts.

A still further object of the invention is to provide a wrench-ring and spring so connected that independent rotative movement of the spring will be prevented.

A still further object of the invention is to provide a locking-cup having straight wall pockets or shoulders for holding the wrench-ring in adjusted position, so that the parts will not be moved under the stress of the spring.

A still further object of the invention is to provide means whereby the wrench-ring may be positively locked in place and accidental movement either forward or backward prevented.

A still further object of the invention is to provide a locking-cup with a convenient finger-hold to permit the ready manipulation of the wrench-ring.

A still further object of the invention is to provide a novel form of dust-guard which in addition to excluding dust serves also as a

means for preventing accidental displacement of the locking-cup and wrench-ring.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a sectional elevation illustrating a portion of a hub and axle provided with an attachment constructed in accordance with the invention, the parts in the position shown acting merely as a dust-guard to prevent the entrance of dirt and dust to the members in frictional contact. Fig. 2 is a similar view showing the wrench-ring adjusted into engagement with the axle-nut and locking said nut to the wheel-hub, so that by turning the latter the nut may be removed. Figs. 3, 4, and 5 are detail plan views illustrating the wrench-ring and its locking-cup in three different positions. Fig. 6 is an elevation looking from the inner face of the wrench-ring. Fig. 7 is a transverse sectional view of the same on the line 7 7 of Fig. 6. Fig. 8 is an elevation looking from the inner face of the auxiliary hub-ring, which forms a part of the attachment. Fig. 9 is a detail perspective view of the locking-cup detached with the auxiliary finger-piece removed. Fig. 10 is a similar view of the finger-piece detached. Fig. 11 is a plan view illustrating a slightly-modified construction of locking-cup.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The hub A, axle B, bushing C, and nut D may be of the usual construction, the hub in the present instance being provided with a band E, which extends inward to the spokes, although the band may be of the construction ordinarily employed on wooden hubs.

To the hub-band is applied a lug-carrying ring 10, said ring having an inwardly-extending annular flange 11, that projects within the hub-band and wholly conceals the outer edge of the latter. This ring 10 is of consid-

erable width in order that it may be adjusted to different positions on hubs of different character, the extent of adjustment depending on the extent to which the nut D projects from the face of the hub-recess. With a ring of sufficient width the device may be applied to hubs of many different sizes. This ring is secured in place in any suitable manner, as by rivets 12 or by screws, and at the inner edge of its flange 11 are arranged a number of lugs 13, three of such lugs being shown in the present instance. These lugs are preferably formed integral with the metal of the flange, and at the juncture of said lugs with the flange are widened shoulders 14 in order to add to the strength of said lugs. These lugs project inwardly through notches formed in the locking-cup 15 and the wrench-ring 16, projecting into the latter to an extent sufficient to engage the coiled compression-spring 17, that is disposed within said ring.

The wrench-ring 16 may be formed of stamped metal, and its main flange 18 has notches 19 opening at the edge of the flange to permit the entrance of the lugs 13. The body portion or base of the ring is provided with a flanged opening 20, said opening being rectangular in form and forming a wrench for engagement with the nut. In normal position, however, this wrench is out of engagement with the nut, the parts occupying the position shown in Fig. 1 while the vehicle is in motion; but when it is desired to remove the wheel the wrench-ring is forced inward to the position shown in Fig. 2 until the nut has entered the opening 20.

Fitted within the main flange 18 of the wrench-ring is the spring 17, and one end of the spring is turned and forced within a suitable opening 21 in the base of the wrench-ring in order to prevent independent rotative movement of said spring. The outer end of the main flange 18 is provided with a plurality of inwardly-bent lugs 23, that serve to limit expansion of the spring and prevent displacement thereof. By securing one end of the spring in the opening 21 said spring is held from rotative movement independent of the ring, and there is no danger of the spring screwing or otherwise moving outward from position.

The locking-cup 15, previously referred to, fits snugly between the flange 11 of the outer ring and the flange 18 of the wrench-ring, but is free to turn in order to properly lock the lugs 13 within the notches 19 of the wrench-ring.

The annular flange 27 of the locking-cup 15 is provided with notches of a number corresponding to the number of lugs 13, and these notches have entrance-mouths 28, opening at the inner edge of the flange for the entrance of the lugs 13, and at the base of each of the entrance-mouths is a passage 29, leading to a pocket 30, that has two abrupt walls

31 and 32, the pocket serving to receive the lugs 13, and when said lugs are entered in these pockets it becomes impossible to turn the locking-cup without turning the hub, and the cup cannot be released until it is pressed inward to an extent sufficient to move the walls 31 and 32 beyond the limits of the lugs 13. Extending from the pocket 30 each lug-receiving notch is recessed, forming shoulders of any number, two shoulders 33 and 34 being shown in Fig. 9, and these serve on occasion to lock against the inner faces of the lugs 13 and prevent outward movement of the locking-cup. These shoulders are brought into play only when the locking-cup and wrench-ring are forced inward to an extent sufficient to engage the latter with the axle-nut, and it then becomes necessary to lock the parts from outward movement under the stress of a spring 17. In some cases inward movement to an extent sufficient to engage the shoulder 33 with the lug will be sufficient; but in other cases it will be necessary to thrust the cup inward until the several shoulders 34 have engaged with the lug, and the number of shoulders may be further increased, as will be apparent on reference to Fig. 11, wherein shoulders 33, 34, 35, and 36 are shown, these being employed so that if it becomes impossible from any cause to thrust the cup inward to an extent sufficient to engage the shoulders 36 with the lugs the intermediate shoulders 35, 34, or 33 may be engaged therewith. This construction also permits the employment of the device in connection with nuts of different type.

To provide for the convenient operation of the manually-adjustable locking-cup, the metal at the base of the cup is stamped out, as shown in Fig. 9, forming four projecting arms 40, and to the end of the cup is secured a finger-plate 41, having corresponding arms 42. This plate is connected to the cup by a central rivet 43, and the arms terminate in lugs 44, which after passing through suitable openings 45 in the base of the cup are upset in order to securely hold the plate in position and prevent independent turning thereof. This structure is such that the cup may be firmly gripped and turned to facilitate its introduction into the wheel-hub or to adjust the position of the wrench-ring.

In order to provide for proper adjustment of the device to wheel-hubs and nuts of different type, the flanges of the wrench-ring and locking-cup are made of sufficient length to permit introduction to the proper extent into hub-recesses of considerable depth. The adjustment may be rendered accurate by the employment of filling-washers 46 between the base of the cup and the base of the wrench-ring, as shown, for instance, in Figs. 1 and 2.

The cup 15 fits within the inner flange 11 in such manner as to prevent the entrance of dust and dirt; but in order to add to the effi-

ciency of the dust-guard the flange 11 is provided with an annular groove or recess 48, in which a split ring 49 is seated, the ring being contracted and forced into place within the flange and thence expanding into the groove or recess and retaining its position therein. As will be seen on reference to Fig. 1, this ring covers the joint or slight space between the flange 11 and the periphery of the cup, and thus effectually shields the inner portion of the device from dust. At the same time this ring serves as a means for preventing any accidental displacement of the locking-cup and wrench-ring; but when it becomes necessary to remove the latter the ring may be readily forced out by inserting a tool into the recess and slightly contracting said ring.

The devices are of such nature that they may be made and sold as separate articles of manufacture and readily applied to existing wheel-hubs. When placed in position, the outer ring 10 is first adjusted and locked by rivets or screws to the hub-band, and after the wrench-ring has been inserted in the locking-cup the two are forced inward, care being taken that the notches 19 of the wrench-ring are in alinement with the entrance-mouths 28 of the cup-notches. The two parts are forced inward until the end of the spring strikes against the inwardly-projecting lugs 13, and during further movement the spring is compressed. After the lugs 13 are fully within the mouths 28 of the notches the locking-cup is turned in order to permit the lugs to enter the passages 29 and thence pass into the locking-pockets 30, where said lugs will be firmly held and any independent rotative movement of the locking cup or ring will be prevented. The parts so adjusted occupy the positions shown in Fig. 1 and serve to effectually exclude dust and dirt.

When it is desired to remove the axle-nut, the operator grasps the finger-piece 41 and forces the cup inward until the lugs are out of the pockets 30 and then turns the cup until the lugs are received against the shoulders 33 or 34. This longitudinal movement forces the ring-wrench over the nut, and the latter will then be held locked to the nut by the engagement of the lugs with the shoulders. The wheel may then be turned either by moving the vehicle backward or by properly turning the wheel while the axle is elevated by a jack, and the walls of the notches at the ends of the shoulders 33 or 34 will be engaged by the lugs 13, so that the locking-cup will be turned with the wheel. As these lugs extend into the straight notches 19 of the wrench-ring, the latter will of course be turned in the direction in which the wheel is moved, and the axle-nut will be unscrewed and removed with the wheel, the nut remaining in the flanged opening 20, so that after applying lubricating material to the axle the wheel may be again placed in position and turned

in the opposite direction in order to screw the nut into place. After the nut is tight the operator again grasps the finger-piece and turns the same in order to allow the lugs 13 to again enter the pockets 30. This releases the ring-wrench from the nut and the parts again assume the position shown in Fig. 1 and resume their functions as a dust-guard.

Having thus described the invention, what is claimed is—

1. In a device of the class specified, a ring having an inwardly-projecting annular flange, concentric with the ring, lugs projecting from said flange, a wrench-ring having notches for the reception of the lugs, and a locking-cup having straight wall-pockets in which said lugs are locked to prevent independent rotative movement of any of the parts in either direction.

2. In a device of the class specified, an outer ring having a flange formed concentric therewith and provided with terminal lugs having widened base portions or fillets, a wrench-ring having notches for the reception of said lugs, a spring arranged within the ring and bearing against the lugs, and a locking-cup notched for the passage of the lugs and having straight wall-pockets in which said lugs are locked to prevent independent rotative movement of any of the parts in either direction.

3. In a device of the class specified, a lug-carrying member, a wrench-ring notched for the reception of the lugs and provided at its inner end with a plurality of independent lugs; a spring arranged within the wrench-ring and having one end secured thereto, the opposite end of the spring bearing against said intumed lugs, and a manually-adjustable locking-cup having stepped straight wall-recesses for the reception of the lugs, said shoulders serving to prevent independent movement of any of the parts in either direction under stress of the spring.

4. In a device of the class specified, a hub-attaching ring having an intumed annular flange provided with inwardly-projecting lugs, a wrench-ring notched for the reception of the lugs, a spring arranged within said wrench-ring and bearing against the lugs, a locking-cup fitting between the wrench-ring and the flange and having pockets for the reception of the lugs, the base or outer face of the cup being stamped out to form finger-engaging portions, and an auxiliary finger-plate extending thereover and provided with terminal lugs that are attached to the base of the cup.

5. In a device of the class specified, a hub-attaching ring having an inwardly-extending annular flange provided with projecting lugs, a wrench-ring recessed for the reception of the lugs, a spring arranged within said ring and bearing on the lugs, a locking-cup having straight wall-notches for the reception of the

lugs and fitting snugly within said flange, the outer face of the nut being stamped out to form finger-holds, and an auxiliary finger-piece riveted to the base of the cup and provided with projecting arms having terminal lugs that extend through openings formed in the base of the cup.

6. In a device of the class specified, a hub-attaching ring having an inwardly-extending annular flange that is provided with an annular groove, a wrench-ring, and a cup extending over the wrench-ring, connecting means between the wrench-ring and cup and the

hub-ring, and a metallic split ring seated within said annular groove and held in place by its expansive tendency, said ring forming a guard to prevent the entrance of dust between the flange and the cup. 15

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses. 20

EDWIN HETHERINGTON.

Witnesses:

J. H. JOCHUM, Jr.,

W. J. DILLON.