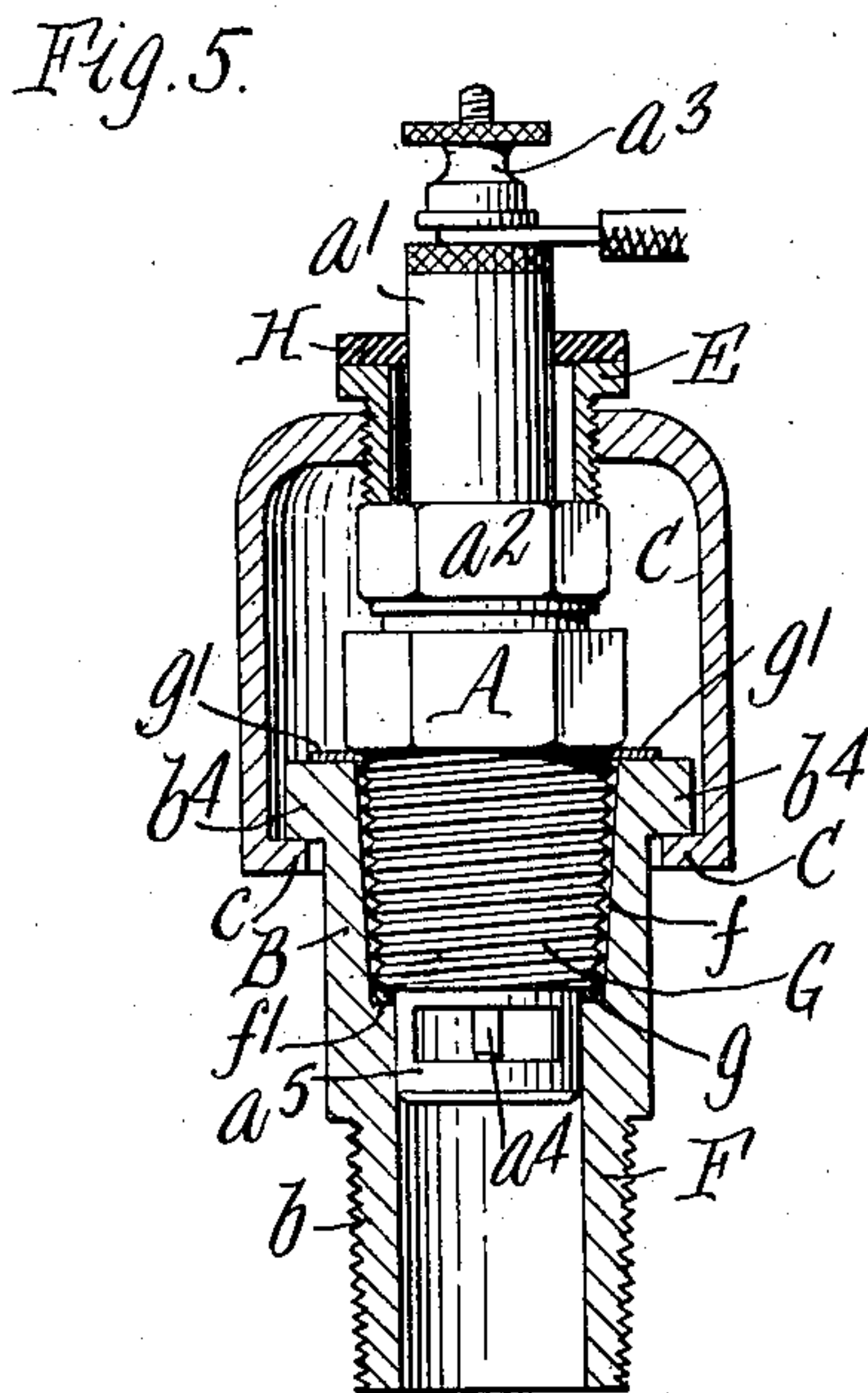
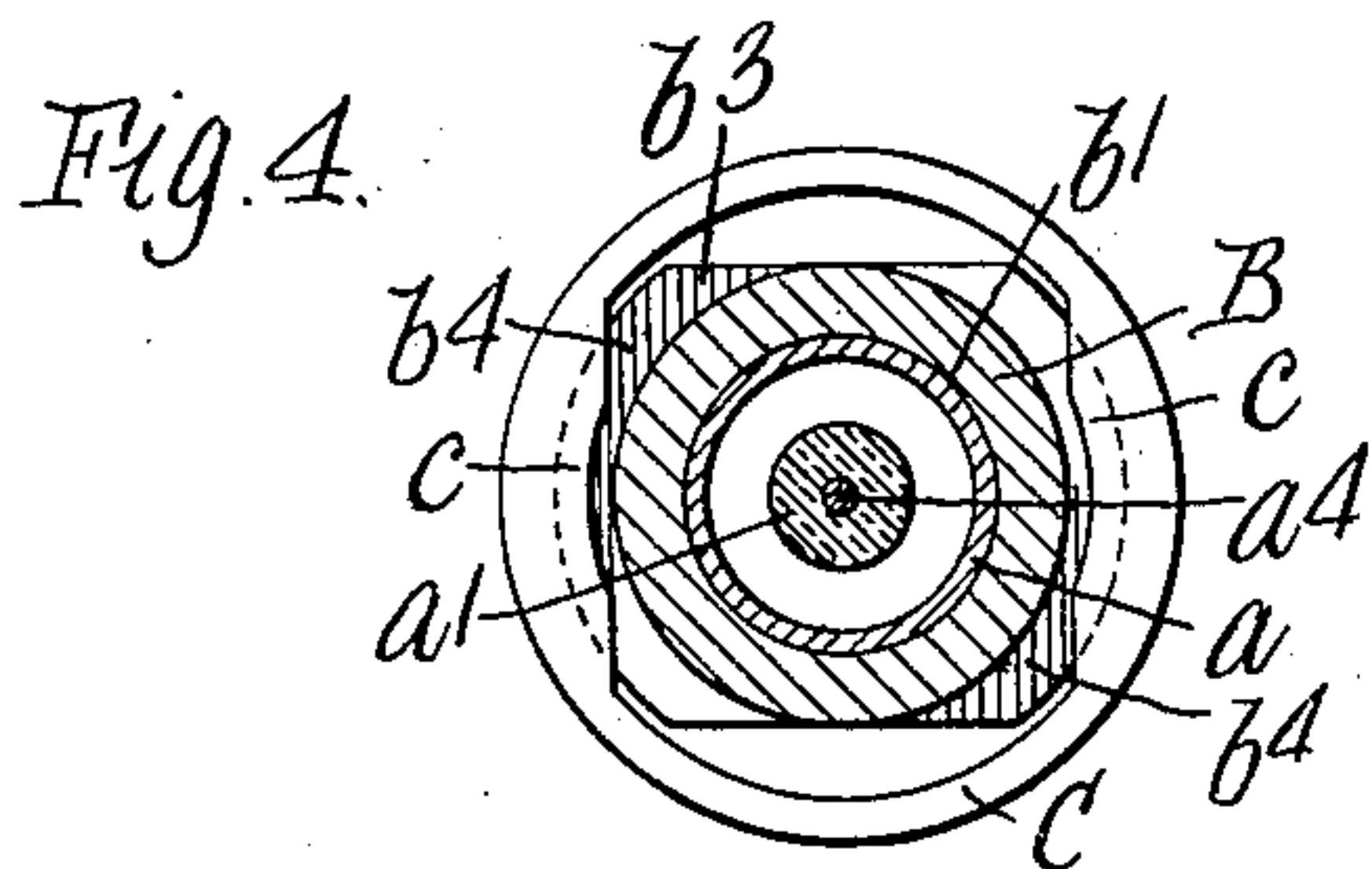
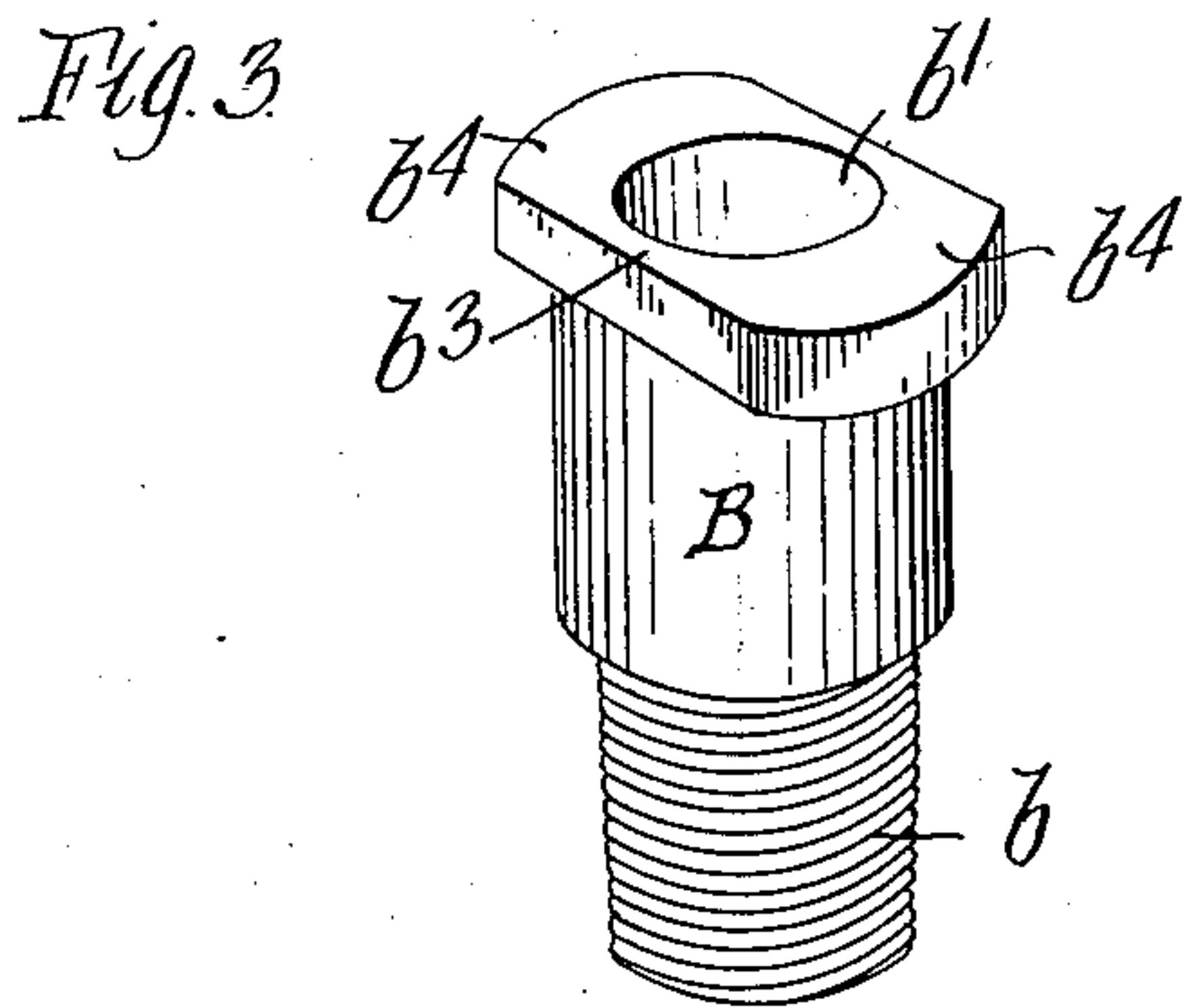
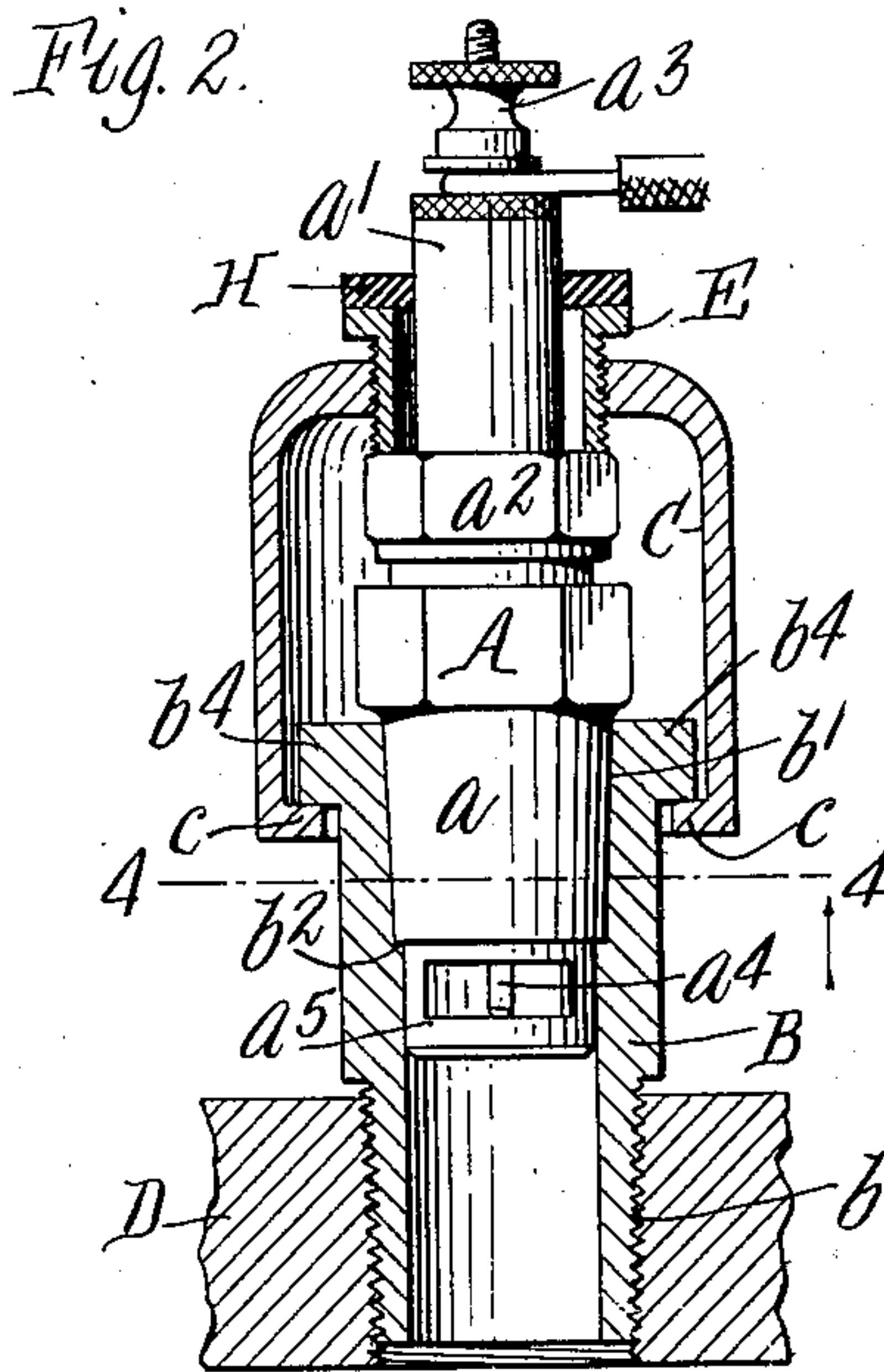
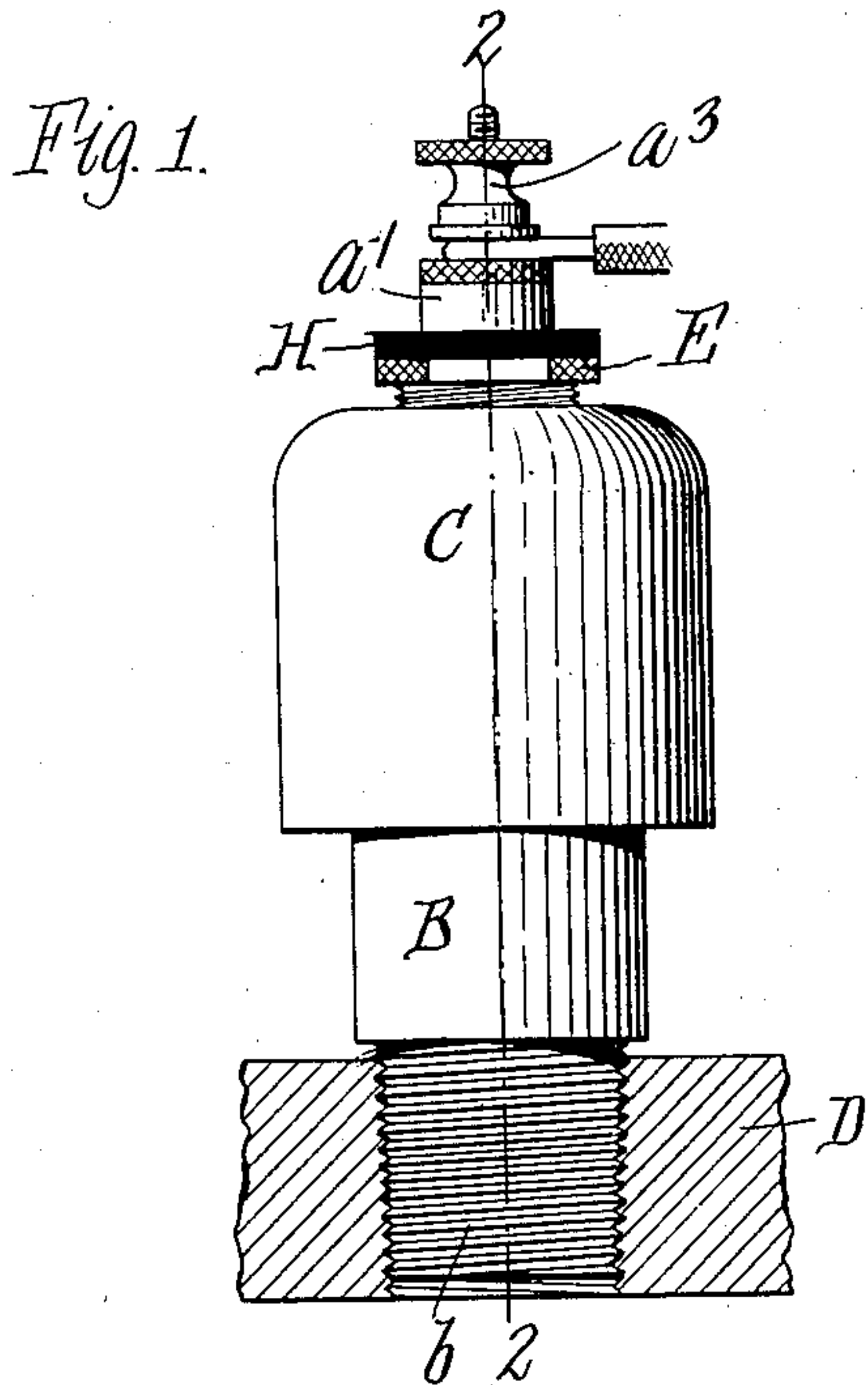


998,200.

Patented July 18, 1911.



WITNESSES.
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UNITED STATES PATENT OFFICE.

WILLIAM J. RANDOLPH, JR., OF MOSCOW, NEW YORK.

SPARK-PLUG HOLDER.

998,200.

Specification of Letters Patent.

Patented July 18, 1911.

Application filed December 8, 1910. Serial No. 596,318.

To all whom it may concern:

Be it known that I, WILLIAM J. RANDOLPH, Jr., citizen of the United States, residing at Moscow, in the county of Livingston and State of New York, have invented a new and useful Improvement in Spark-Plug Holders, of which the following is a specification.

This invention relates to holders for releasably securing spark plugs in their operative positions in the cylinders of internal combustion engines.

The objects of this invention are to provide a simple, strong and inexpensive holder which is adapted to be secured to the engine cylinder and which is so constructed that a spark plug can be rigidly held therein and can be readily and quickly inserted or removed therefrom without detaching the holder from the cylinder, and which is adapted to receive and hold in place the standard types of spark plugs in general use without requiring any material alterations to be made therein; and also to provide a holder which can be manufactured at a small cost and can be secured in the usual spark plug opening in the engine cylinder and allowed to remain permanently in place therein unless broken or damaged, in which case it can be easily removed and a new holder secured on the cylinder.

In the accompanying drawings: Figure 1 is a side elevation of a spark plug and a holder therefor embodying the invention. Fig. 2 is a sectional elevation thereof on line 2—2, Fig. 1. Fig. 3 is a perspective view of the base of the holder. Fig. 4 is a sectional plan on line 4—4, Fig. 2, looking in the direction of the arrow. Fig. 5 is a view similar to Fig. 2, showing a holder of modified construction.

Like reference characters refer to like parts in the several figures.

A represents the spark plug which may be of any ordinary construction. That shown in Figs. 1-4, comprises a bushing *a* in which a porcelain or insulating tube *a'* is suitably secured by means of a gland nut *a''*. The upper end of this tube is provided with the usual binding post *a'''* for connection with the source of current, and at its lower end the tube is provided with a suitable spark point *a''''* which is connected with the binding post. The spark is formed between the spark point *a''''* and the surrounding wall of a hollow extension *a'''''* of the

bushing *a*. The bushing *a* of this type of spark plug as it is ordinarily constructed is externally screw-threaded for securing the spark plug directly to the engine cylinder. When the spark plug is to be used with the holder shown in Figs. 1-4, this bushing is provided with a smooth external conical surface. This may be easily done by removing the external screw threads from the bushing as ordinarily constructed, or by employing a special form of bushing for spark plugs which are to be used with this holder.

It will be understood that the construction of the spark plug forms no part of this invention, and while the holder is particularly adapted for use with the type of spark plugs described, its use is not so limited and it may be readily adapted for use with spark plugs of any usual and desired construction.

The holder for the spark plug comprises a hollow base portion or bushing B which has a seat for the spark plug and which is adapted to be secured to the engine cylinder, and a hollow detachable cap or cover portion C which engages a part on the spark plug and interlocks with the base to secure the spark plug in place in the holder. The base B of the holder is adapted to be secured to the engine cylinder D in any suitable manner. As shown, it is provided at its lower end with a screw-threaded portion *b* of the standard size commonly used to secure spark plugs on the engine cylinder so that it will engage in the usual spark plug opening in the engine cylinder without requiring any change therein.

The base B is provided in its upper portion with a tapering socket *b'* which terminates in an annular shoulder *b''* and forms a seat for the bushing *a* of the spark plug in which the latter is adapted to fit snugly with its lower end resting upon the shoulder *b''* and its end extension *a''''* projecting downwardly in the opening in the base beyond this shoulder.

The upper end of the base B is provided with a flange *b'''* having opposite outwardly-extending lugs or ears *b''''*, and the cap C is provided at its lower end with opposite inwardly-extending lugs or flanges *c* which are adapted to engage under the ears *b''''* of the base and thus lock the cap from outward movement away from the base. The opening in the lower end of the cap is of sufficient size so that the cap will slide freely over the upper end of the base when it is

turned, so that its lugs *c* extend at substantially right angles to the ears *b*⁴ of the base. The cap can thus be easily fitted over or removed from the base and when the cap is in position on the base it is locked thereon against outward movement by turning to bring its lugs *c* in engagement with the under side of the ears *b*⁴ of the base.

The cap *C* is provided at its upper end with a threaded hole or opening in which is adjustably mounted an externally threaded screw sleeve *E* through which the upper end of the spark plug extends. The lower end of the screw sleeve *E* is adapted to bear upon a part of the spark plug, for example, the gland nut *a*², as shown. By adjusting this sleeve when the cap *C* is in locking engagement with the base *B*, the spark plug can be clamped firmly in place on its seat in the base, so as to form a tight joint which will prevent the escape of gas from the engine cylinder and at the same time the clamping movement of the sleeve draws the interlocking portions of the cap and the base firmly together so that the cap will be securely held in place on the base. A washer or ring *H* of rubber or other suitable insulating material is secured to the spark plug above the sleeve *E* to prevent short-circuiting of the current between the binding post and the holder.

In Fig. 5 is shown a modified construction which is adapted for spark plugs having the usual threaded bushing. In this construction the base *F* of the holder is provided with an enlarged socket *f* and shoulder *f*['] forming the seat in which the threaded bushing *G* of the spark plug is adapted to fit. Between the end of the threaded portion of the bushing and the shoulder *f*['] is placed a packing ring *g* of brass or other suitable material so that when the spark plug is clamped against this shoulder a tight joint will be formed therewith. The bushing *G* may also be provided at its upper end with a suitable washer *g*['] which is adapted to engage the end of the base *F* when the spark plug is clamped in place and assists in preventing the gases from the engine cylinder from escaping through the joint.

The base of the holder when once secured to the engine cylinder can be left permanently in place thereon unless it becomes broken or damaged. The spark plug is secured in the holder by placing its bushing in the seat in the base of the holder, fitting the cap of the holder over the end of the spark plug and the base and turning the cap to bring its lugs into position to engage the ears of the base. The sleeve *E* can then be screwed inwardly in the cap to engage the gland nut *a*² and clamp the spark plug firmly against its seat. To remove the spark plug from the holder it is only necessary to give the screw sleeve *E* a short turn to release the clamping engagement of the parts and then

turn the cap to bring its lugs out of engagement with the ears of the base. The spark plug and cap can then be lifted from the base and the plug removed from the cap. The spark plug can thus be easily and quickly secured in and removed from the holder. The screw sleeve *E* can be adjusted in the cap so that it will require but a partial turn thereof to clamp the spark plug on its seat, and the size of the cap and base of the holder may be varied to suit the particular type of spark plug which is to be used.

The spark plug occupies only the upper portion of the hole or opening in the base of the holder and the lower portion thereof below the end of the spark plug forms an auxiliary explosion chamber which opens into the engine cylinder. This largely prevents the oil in the cylinder from coming in contact with the end of the spark plug and gumming the same. The spark plug thus does not require as frequent removal for cleaning and replacing as in constructions where the end of the plug projects into the cylinder or lies close to the inner wall thereof.

I claim as my invention:

1. A spark plug holder comprising a base adapted to be secured to the cylinder of an engine and having a seat for the spark plug, a cap detachably secured to said base, and clamping means on said cap which are adapted to engage said spark plug and clamp the same against said seat, substantially as set forth.

2. A spark plug holder comprising a base adapted to be secured to the cylinder of an engine and having a seat for the spark plug, a cap detachably secured to said base, and a clamping device adjustably secured to said cap and adapted to engage said spark plug and clamp the same against said seat, substantially as set forth.

3. A spark plug holder comprising a base adapted to be secured to the cylinder of an engine and having a seat for the spark plug, a cap detachably secured to said base and having an opening through which the upper end of the spark plug is adapted to extend, and a screw sleeve mounted on said cap in said opening and adapted to engage the spark plug and clamp the same against said seat, substantially as set forth.

4. A spark plug holder comprising a base adapted to be secured to the cylinder of an engine and having a seat for the spark plug, a cap for said base, said cap having parts which in one position of said cap on said base engage cooperating parts on said base and prevent separation of said cap from said base and in another position of said cap are disengaged and permit the removal of the cap from the base, and clamping means on said cap which are adapted to engage said

spark plug and clamp the same against its seat in said base, substantially as set forth.

5 A spark plug holder comprising a base adapted to be secured to the cylinder of an engine and having a seat in its upper portion for the spark plug and an auxiliary chamber in its lower portion below the spark plug which is adapted to communicate with the engine cylinder, a cap detachably secured to said base, and clamping means on

said cap which are adapted to engage the spark plug and clamp the same against said seat, substantially as set forth.

Witness my hand in the presence of two subscribing witnesses.

WILLIAM J. RANDOLPH, JR.

Witnesses:

C. M. FIERO,

CHAS. E. GREEN.