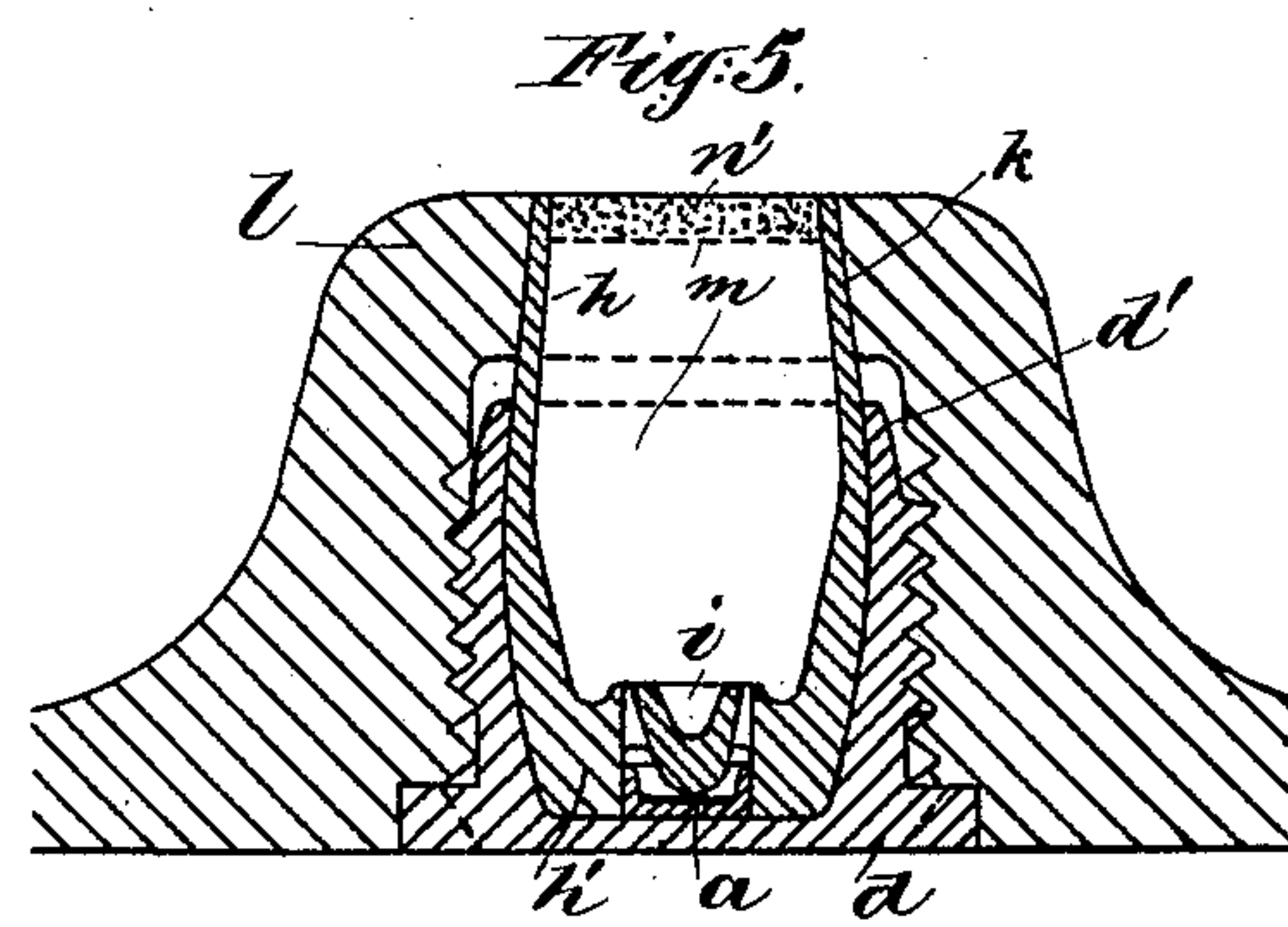
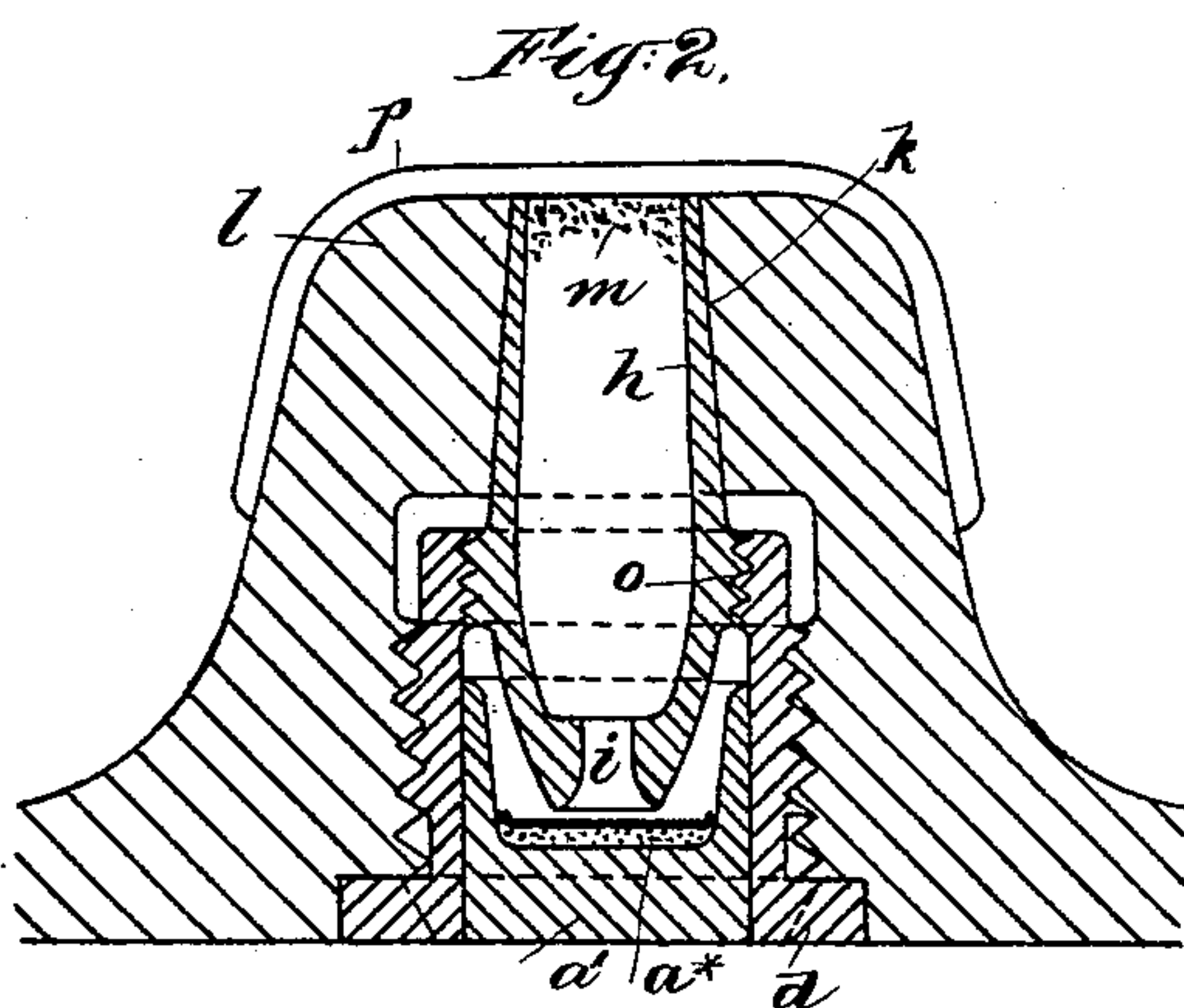
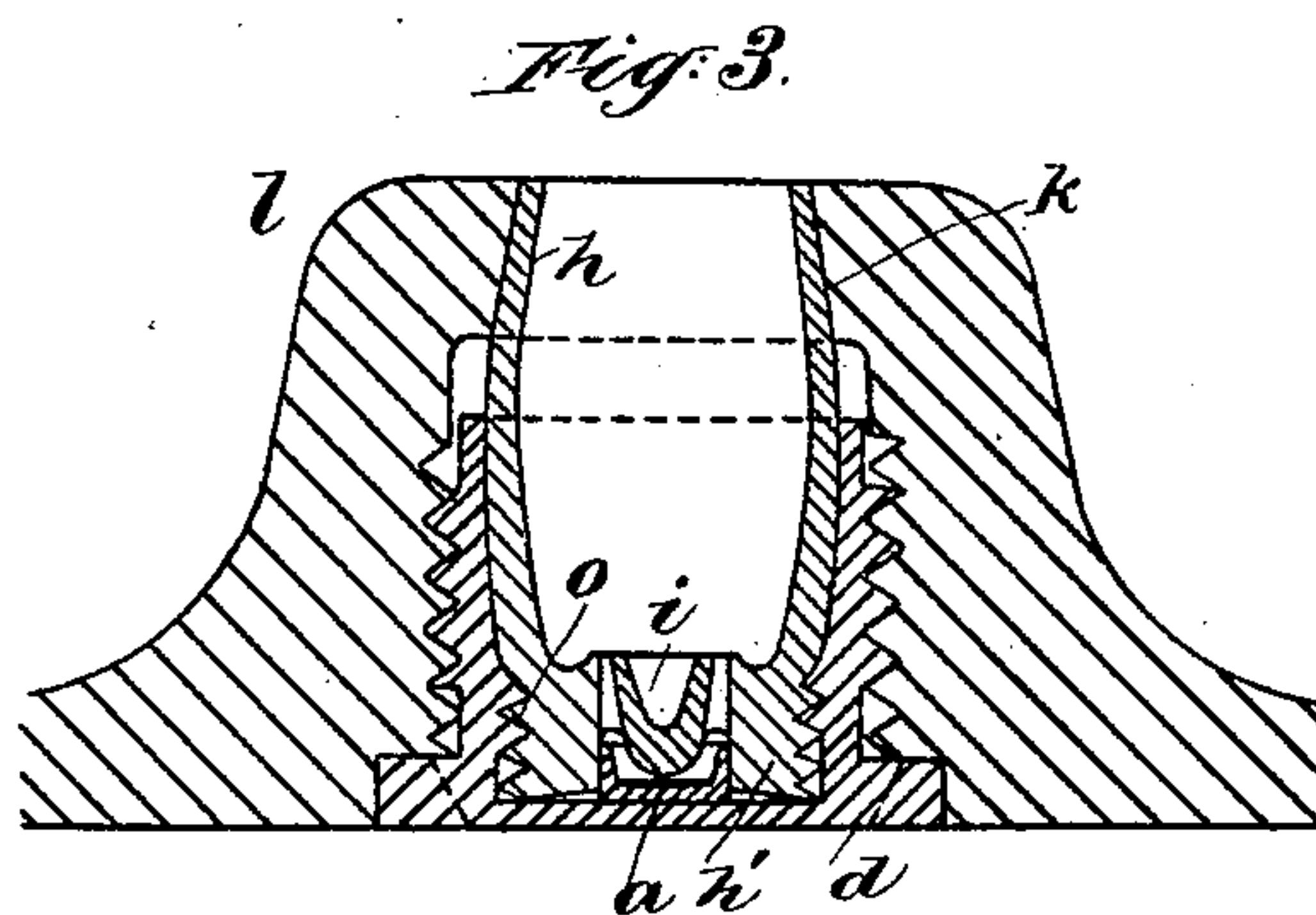
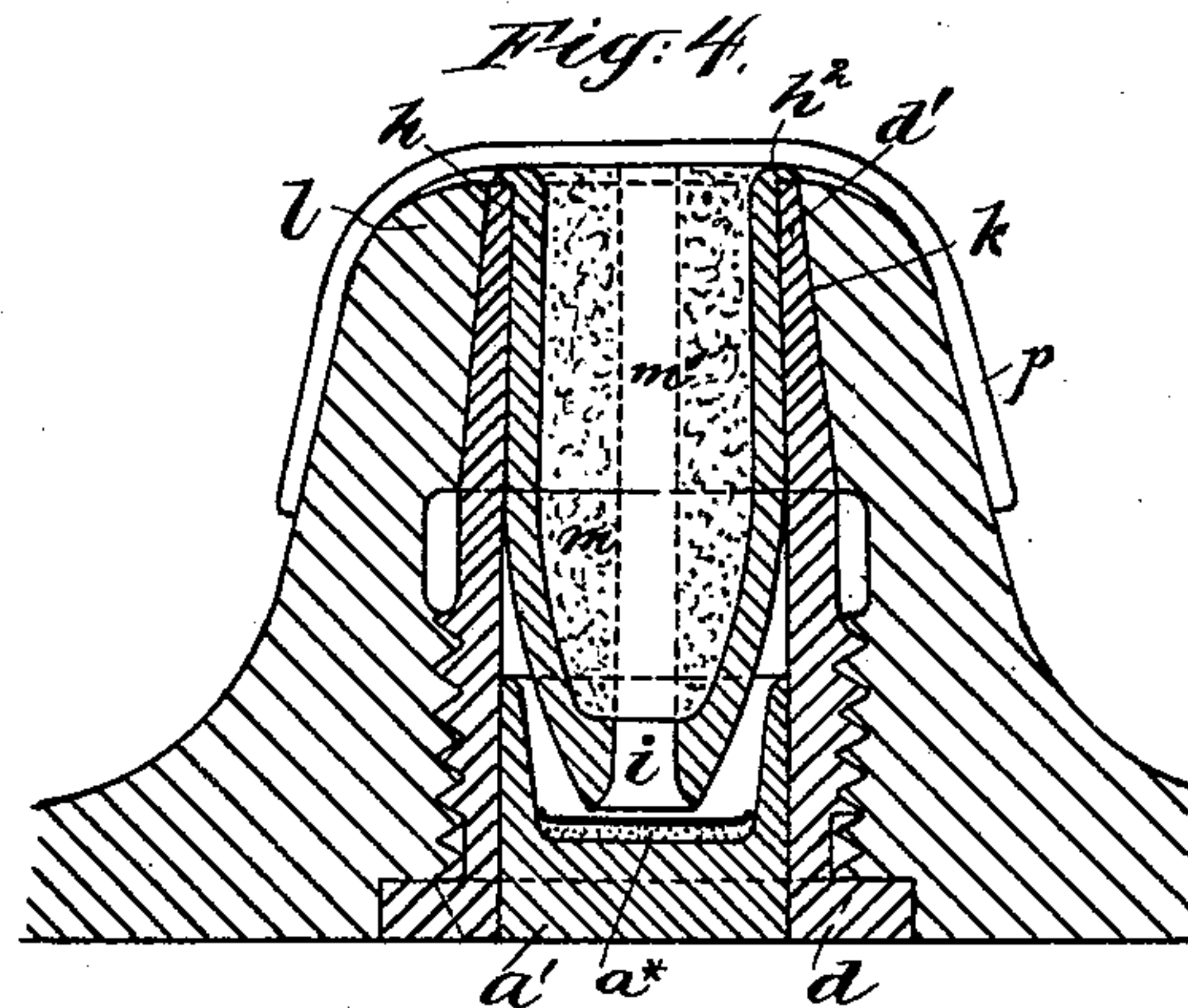
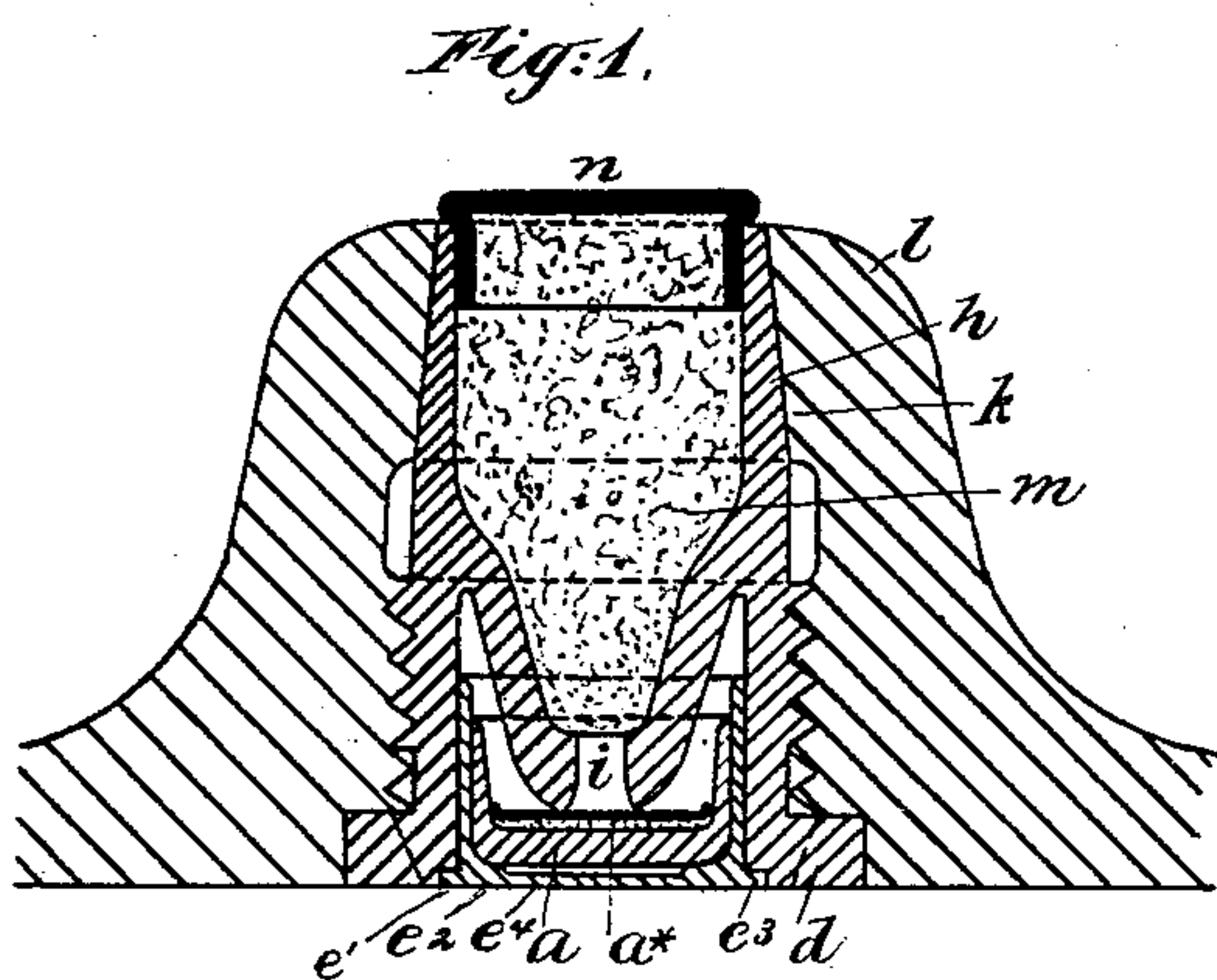


(No Model.)

W. LORENZ.
PRIMER FOR GUN CARTRIDGES.

No. 431,601.

Patented July 8, 1890.



Witnesses:

H. A. Johnstone.
Charles F. Searle,

Inventor:

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by his attorney
Thomas Drew Stetson

UNITED STATES PATENT OFFICE.

WILHELM LORENZ, OF CARLSRUHE, BADEN, GERMANY.

PRIMER FOR GUN-CARTRIDGES.

SPECIFICATION forming part of Letters Patent No. 431,601, dated July 8, 1890.

Application filed November 15, 1888. Serial No. 290,871. (No model.) Patented in Germany April 10, 1889, No. 46,698.

To all whom it may concern:

Be it known that I, WILHELM LORENZ, residing at Carlsruhe, Grand Duchy of Baden, in the Empire of Germany, have invented a certain new and useful Improvement in Primers for Gun-Cartridges, (for which I have obtained a patent in Germany, No. 46,698, dated April 10, 1889,) of which the following is a specification.

I have devised and wrought out an improvement in priming contrivances for gun-cartridges, in which the primer is inclosed in a screw-threaded box or cover adapted to be screwed in and out of position in the cup of the cartridge, and provided with a tapering lengthening piece, which I term an "obstruction-tube," with its smaller end toward the cartridge. A corresponding conical bore is produced in the bottom or front of the cup of the cartridge-case, and on applying the primer the tight fit of the tapering portion serves for the protection of the cup against the passage of the gases rearward. At the screwing-in of this cover the tubular lengthening piece will bear tightly against the inner sides of the bore of the bottom of the cartridge-cup, and as the explosion of the powder-charge produces a strong pressure of gas this tubular piece will be expanded and pressed still more closely against the inner sides of the bore. This will be the more tight the higher the pressure of the explosion-gas rises. This obstruction-tube is more especially important for large guns. In such the very high pressure of the gas would penetrate through the spaces along the screw-threads of the cover and the cup, and thus would not only foul the cup of the cartridge and its thread, so that an exchange of the used cover for a new one with fresh cap-primer would soon be difficult and finally impossible, but it would foul also the locking and firing mechanisms, so as to wholly prevent the charging of the gun. A special advantage of this obstruction-tube is its forming an entirely-metallic protection without applying any other packing materials. The lengthening piece or obstruction-tube may be filled with a charge of powder or of other suitable explosive material, and serve as a priming-tube.

The accompanying drawings form a part of this specification and represent several examples of such tubular lengthening pieces.

All the figures are central longitudinal sections.

Referring to Figure 1, *a* is the cap-primer containing fulminate *a*^{*}, and *d* is the cap-cover which can be screwed in and out of position, the anvil *i* being made solid with it, and with the obstruction-tube *h* also made solid with it. This tube *h* fits closely into the conical tube *k* of the front portion *l* of the cup. The tube *h* is filled with fine powder *m*, and its front end is closed by a cap *n*. Before receiving my primer into the cartridge-shell the front cap *n* is removed. At the explosion of the charge of the cartridge the highly-expanded gases entering the tube *h* tend to expand the walls of the same and press them closely to the inner sides of the hole, so that a thorough check or obstruction to gas will be obtained.

The charging of the obstruction-tube, like the charging of any other primer, is eminently useful. The priming-flash of the cap inflames the fine explosive material contained in this tube, and this produces a larger flash of fire, which energetically penetrates into and rapidly and uniformly inflames the coarse-grained charge of the cartridge. An important point in such priming contrivances, which can be screwed in and out of position, consists in forming the protecting bottom for the cap-primer by a special protection-cap *e*², of which the outer projecting rim *e*³ is placed in a corresponding recess of the cover *d*. There is left some play between the outer bottom *e*⁴ and the base of the cap-primer *a*, in order to obtain a greater safety against any accidental pressure against the bottom *e*⁴, and whereby the latter might suffer a deformation which might produce an accidental explosion of the cap-primer and therefore of the cartridge.

Modifications may be made by any good mechanic without departing from the principle or sacrificing the advantages of the invention.

Fig. 2 shows a modification. In all the cases I have made the obstruction-tube *h* solid, or in one with the anvil *i*. In this form

I have connected it by screw-threads *o* to the cover *d*. The whole can be screwed in and out of position, like the form of the invention first shown.

5 Fig. 3 shows another form. In this the obstruction-tube *h* is screwed into the cover *d* by means of screw-threads *o*, provided near the rear end of the tube, and corresponding internal screw-threads provided near the bot-
10 tom of the cover *d*. A separate cap-primer *a* is applied in the strong closing part or bottom *h'* of the obstruction-tube.

Fig. 4 shows a modification in which the obstruction-tube *h* is inclosed in a tubular conical extension *d'* of the cover *d*. By virtue of the conical shape of the walls of *h* and *d'* fitting tightly together the tube *h* and the anvil *i* are retained in position, and there can be no displacing of the parts by the pushing
20 forward of the cap-primer by the action of the striking-bolt. Any displacement rearward is prevented by the flanged rim *h*². In this arrangement the explosive gases are tending to expand both the tubes, pressing
25 *h* outward against *d'* and pressing both together outward against the inclosing-surfaces *l* of the cup of the cartridge.

Fig. 5 shows another form of such obstruction-tube *h*, fitted in a cover *d*, which latter
30 extends forward to a smaller extent. The tube *h* is provided with a strong bottom *h'*, with anvil *i* therein, and with cap-primer *a*, similar to the arrangement shown in Fig. 3. In Fig. 5, as in Figs. 1, 2, and 3, the tube *h* fits
35 closely into the hole *k* of the bottom of the cup. A short conical extension *d'* holds the tube *h* and prevents any displacement forward or toward the interior of the cartridge. The front of the obstruction-tube may be
40 closed by a plug *n'*, as in Fig. 5, or by means of a pasted-up cap *p*, made of paper, paste-board, felt, or other suitable material, applied as in Figs. 2 and 4.

In all the forms of the invention the filling
45 of explosive material may be hard and firm and provided with a bore *m'*, Fig. 4, so that the flash, starting from the cap-primer *a*, by the friction along the sides of this bore will

produce in the whole length the inflammation of the charge *m*. 50

The cap-primers may be of the common form or have a very strong bottom *a'*, Figs. 2 and 4. They should be so constructed that no deformation nor striking through may be possible, but that the cap-primer may be
55 pushed forward like a piston against the anvil and thus be detonated.

Parts of the invention can be used without the whole. The several forms shown in Figs. 2, 3, 4, and 5, and many others, may be used
60 with success. The cap-primers may be covered by a protecting-cap *e'*, closing above the cover *d*, in the manner shown in Figs. 3 and 5.

I claim as my invention—

1. In a primer for gun-cartridges, the tapering tubular front portion *h*, screw-threaded rear portion *d*, cover *n*, and an inclosed stiffly-supported anvil *i*, in combination with each other and with a cap-primer *a* fitted in the rear, carrying fulminate *a**, and with a protection-cap *e'* covering the rear of the latter, all substantially as herein specified. 65

2. A primer having the tapering tubular front portion *h*, having screw-threads upon its rear portion *d*, a cap *a*, inclosing an anvil
75 *i*, and containing a fulminate *a**, said tube *h* carrying the powder-filling *m*, inclosed at its front end by means of the cap or cover *n*, all arranged substantially in the manner and for the purpose set forth. 80

3. The primer *h d*, having the front tubular and tapered and the rear screw-threaded, as shown, in combination with the cup *l* of a cartridge-shell, the latter being tapered and screw-threaded to match, all arranged for
85 joint operation substantially as herein specified.

In testimony whereof I have hereunto set my hand, at Karlsruhe, this 22d day of August, 1888, in the presence of two subscribing witnesses. 90

WILHELM LORENZ.

Witnesses:

FRIEDRICH LORCH,
ADOLF LEHNE.