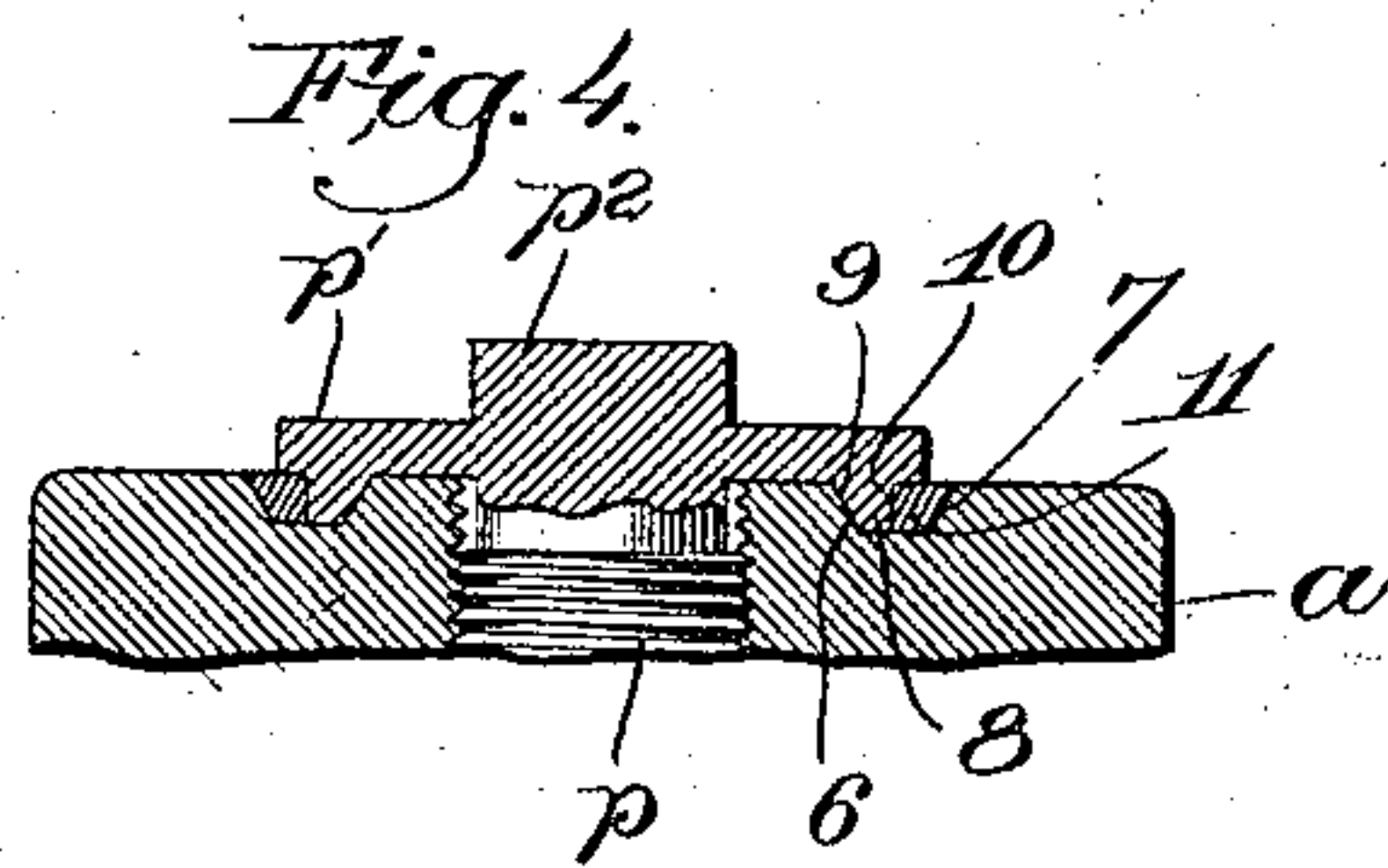
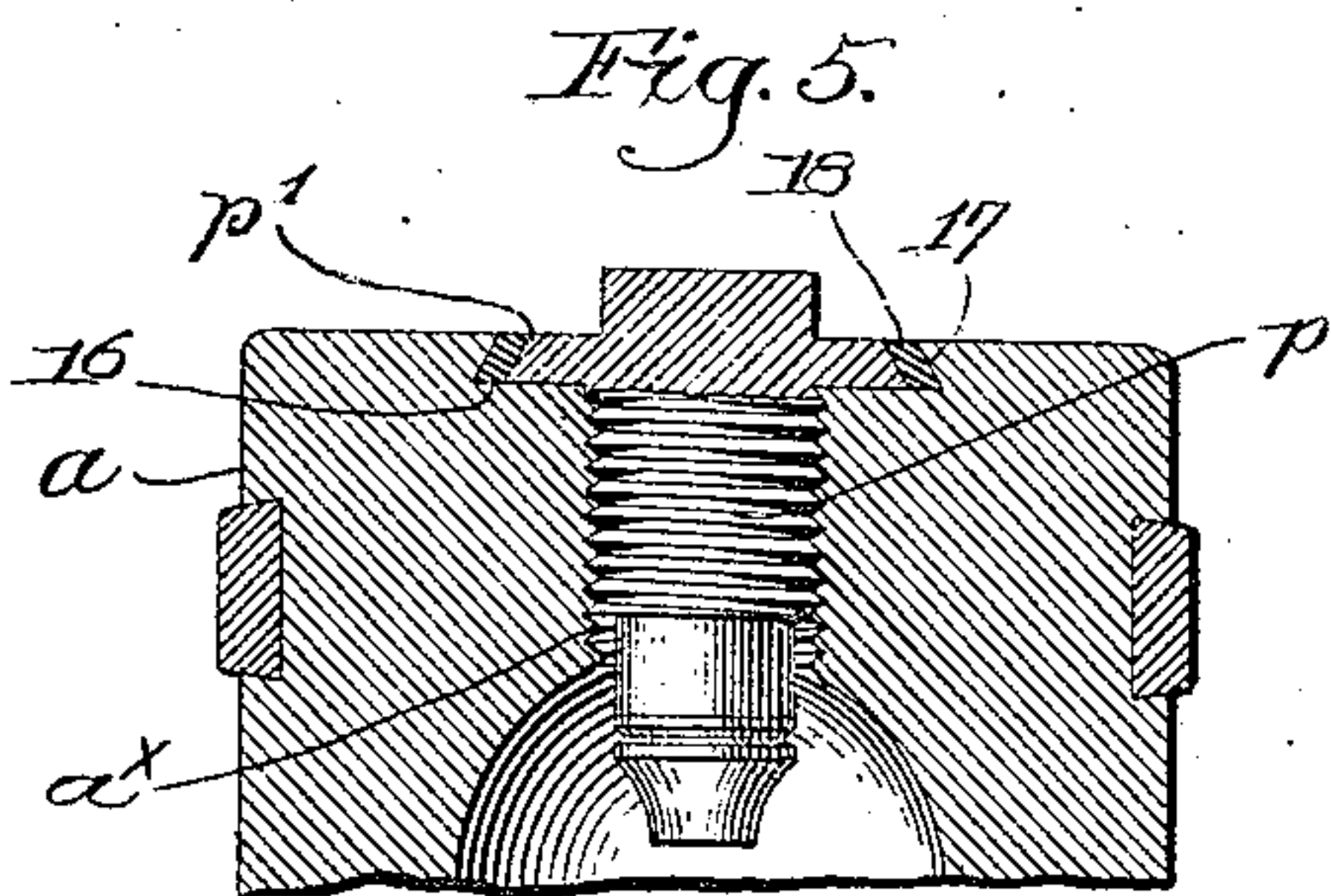
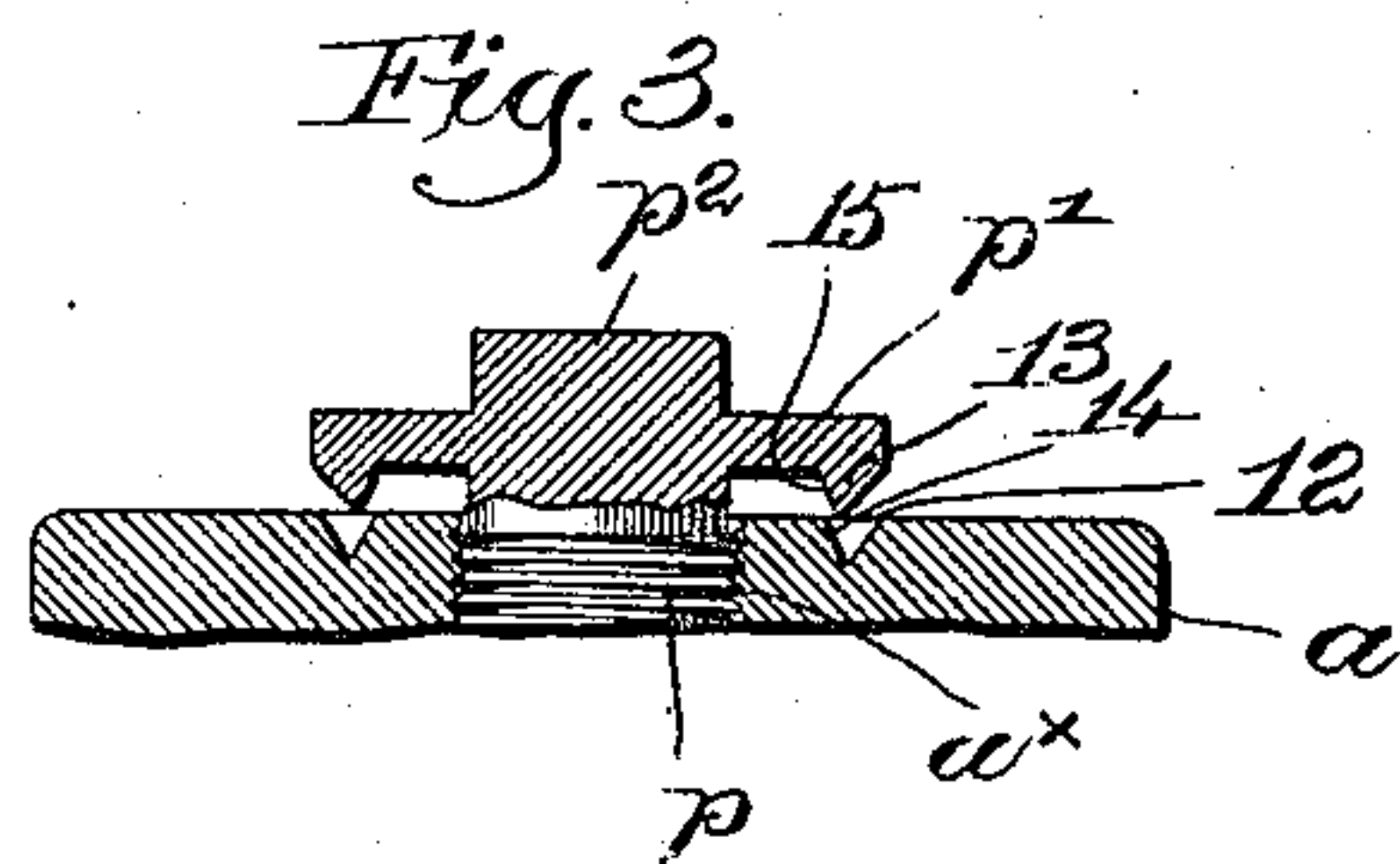
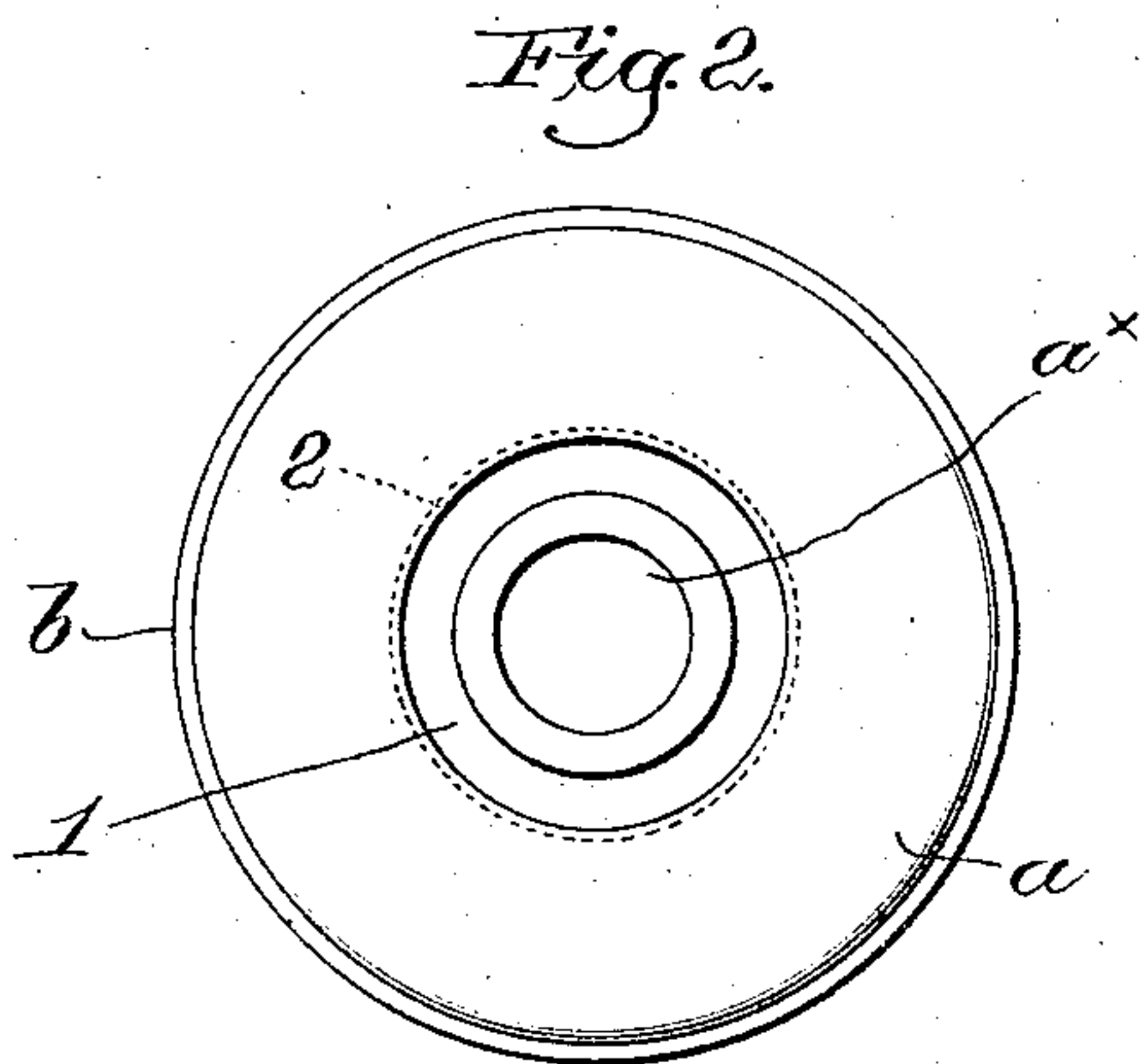
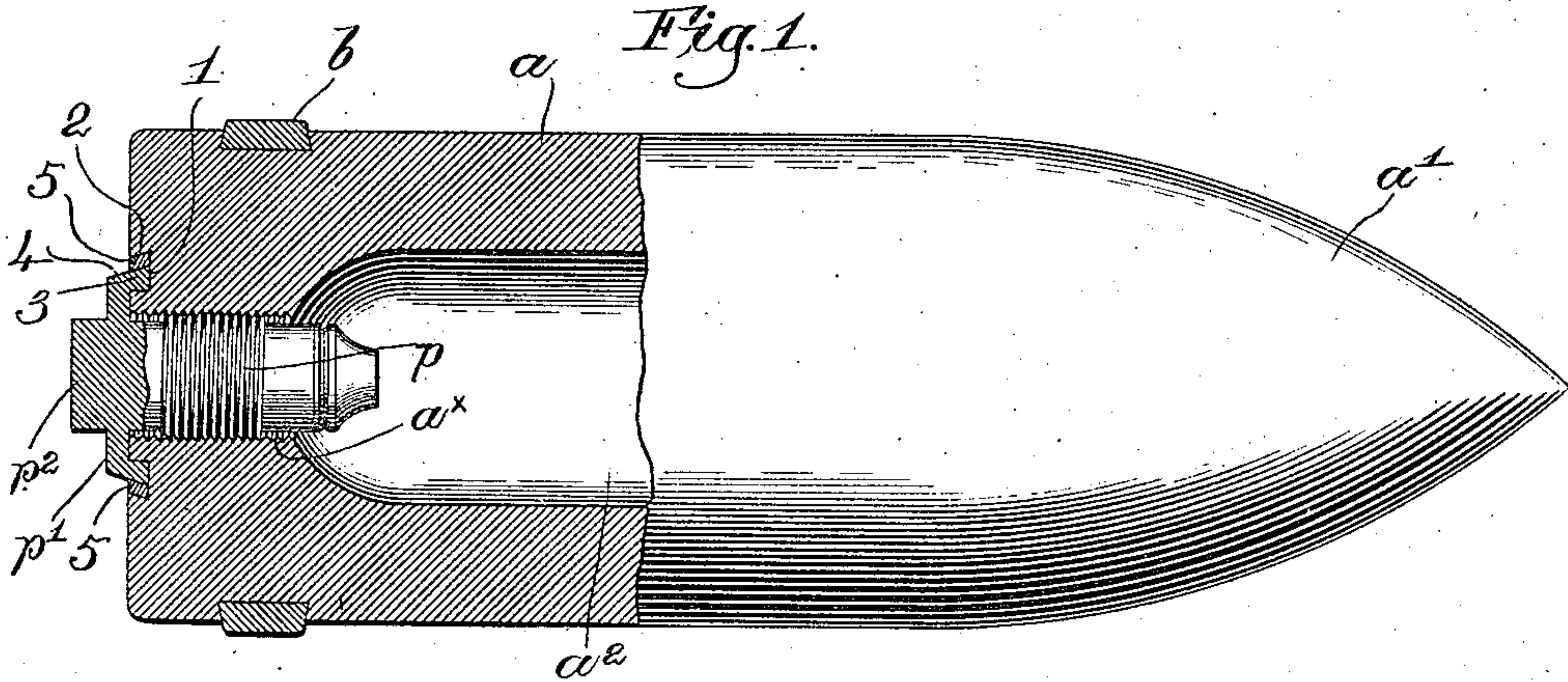


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PROJECTILE AND FUSE PLUG THEREFOR.
APPLICATION FILED NOV. 9, 1906.



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UNITED STATES PATENT OFFICE.

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PROJECTILE AND FUSE-PLUG THEREFOR.

No. 843,665.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed November 9, 1906. Serial No. 342,600.

To all whom it may concern:

Be it known that we, CHARLES F. COWDREY and HENRY E. COWDREY, citizens of the United States, and residents of Fitchburg, county of Worcester, State of Massachusetts, have invented an Improvement in Projectiles and Fuse-Plugs Therefor, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

High-power ordnance projectiles chambered to receive a bursting charge are subjected to very high gas-pressure in the gun by the combustion of the propulsive charge, and the gases so generated are so highly penetrating that great precautions must be observed to prevent premature explosion of the bursting charge due to such gases entering the chamber.

In United States Patent No. 763,370, granted to us June 28, 1904, means are provided to prevent the passage of the gases of combustion through the pores or interstices of the cast-iron forming the base of the projectile, so that a cast-iron chambered projectile is to the extent shown equal to a steel projectile so far as concerns safety from premature bursting by penetration of gases into the chamber. Probably the majority of such projectiles have the firing or fuse plug inserted in the base, the body of the plug being threaded to screw into corresponding threads in an opening in the projectile-base communicating with the chamber. So far as our prior patent is concerned no special means were provided for sealing this thread, and it has been found that in order to prevent access of the gases of combustion to the chamber such thread must be thoroughly sealed.

Our present invention accordingly has for its object the production of simple and efficient means for sealing the thread of a chambered projectile to thereby prevent the gases from traversing the plug-opening to the chamber, our invention being equally adapted to cast-iron or steel chambered projectiles.

The various novel features of our invention will be fully described in the subjoined specification, and particularly pointed out in the following claims.

Figure 1 is a partial side elevation and longitudinal section of a chambered projectile

with one embodiment of our present invention applied thereto, the base portion of the projectile and the flanged head of the fuse or firing plug being shown in section. Fig. 2 is an end elevation of the base of the projectile with the plug removed. Fig. 3 is a longitudinal sectional detail of a projectile-base and fuse-plug, showing our invention embodied in a somewhat different form. Fig. 4 is a similar view with yet another form in which our invention is embodied. Fig. 5 is a like view showing practically another mode of sealing the thread embodied in our invention.

The projectile a , having an ogival point or head a' and a chamber a^2 to receive the bursting charge, the copper or soft-metal band or ring b , and the threaded hole or opening a^x in the base of the projectile, communicating with the chamber a^2 and adapted to receive the fuse or firing plug, the body p whereof is externally threaded to screw into the opening a^x , may be and are all of substantially well-known construction. Ordinarily the plug has a head or flange p' and a polygonal projection p^2 , by means of which the plug can be screwed home, the flange resting on the base of the projectile; but it has been found that such arrangement does not provide a gas-seal for the thread.

In accordance with our present invention the projectile and plug are so constructed that an annular projection or lip on one is made to seat tightly in a recess formed in the other of said parts, thereby making a thoroughly effective gas-seal for the thread. This seal may be constructed in various ways in accordance with our invention, and, referring to Figs. 1 and 2, we have shown the base of the projectile provided with an annular recess 1 concentric with the plug-opening a^x , the outer wall 2 of the recess being undercut slightly. The flange p' of the plug is provided on its inner face with an annular projection or rim 3, having preferably an inclined outer face 4, the projection entering the recess 1 when the plug is screwed home and bottoming tightly on the bottom of the recess. As the recess is wider than the projection 3, an annular space will be left between the face 4 and the outer wall 2 of the recess, such space being filled in with lead, cement, or other suitable sealing material, as at 5, inserted in a plastic or molten state and allowed to harden. An absolutely gas-

tight seal is thereby formed for the thread around the plug, preventing any passage of gases of combustion to the chamber a^2 of the projectile. The undercutting of the wall 2 of the recess assists in retaining the sealing material in place.

In the construction just described the inner wall of the recess and the adjacent wall of the projection 3 are concentric and cylindrical, making a snug fit when the plug is in position. It will be obvious that after the sealing material 5 is in place the plug cannot be removed without first removing such material; but in Fig. 4 we show a construction whereby the plug can be removed after the sealing material is in place.

Referring to Fig. 4, the recess in the base of the projectile has its inner wall 6 inclined inward and its outer wall 7 flared, so that the recess is wider at the top than at the bottom. The flange p' of the plug has an annular projection 8 on its under face; but the inner side of said projection is beveled, as at 9, while the outer face is undercut at 10. We prefer to so incline the side 9 that when the plug is screwed home such side 9 will be forced into intimate contact with the inner wall 6 of the recess and will actually expand the projection 8 slightly. This results in forming a gas-seal by the forcible contact of the two surfaces 6 and 9; but an additional seal is provided by filling in sealing material 11 between the recess-wall 7 and the outer side 10 of the projection, the undercutting acting to prevent loosening of the seal 11, but also permitting the plug to be withdrawn without first removing such seal. Inasmuch as the plugs are usually made of brass or similar metal, the expanding of the projection 8 as described can be readily effected by the operation of screwing home the plug, a very slight difference in the angles of the surfaces 6 and 9 being sufficient to form a seal thereat.

The form of recess shown in Fig. 4 may be made somewhat more readily in the projectile-base than the form shown in Fig. 1, as no undercutting is required, and the undercut 10 on the plug is easily made.

By slightly changing the cross-section of recess and projection we can dispense with separate sealing material, as in Fig. 3. In Fig. 3 the recess 12 is V-shaped in cross-section, and the projection 13 on the plug-flange p' is correspondingly shaped; but the inner wall 14 of the recess is at a slightly different angle from the face 15 of the projection. As the plug is screwed home this difference in angularity forces the surfaces 14 and 15 into sealing engagement, and as the projection is fairly seated in the recess the expanding of the projection forces its outer face into sealing engagement with the adjacent outer wall of the recess. The plug is shown as only part way home in Fig. 3 to more clearly illustrate the construction.

In the arrangement shown in Fig. 5 the base of the shell is counterbored at 16 concentric with the plug-opening a^x , and preferably the outer wall of the annular recess thus formed is undercut, as at 17. The head or flange p' of the plug seats in the recess when the plug is screwed home, as shown, and lead or other suitable sealing material 18 is introduced into the annular space between the undercut wall 17 of the recess and the periphery of the plug head or flange, thereby sealing the thread.

In any of the forms in which our invention is embodied the thread of the plug is completely and effectually sealed to the gases of combustion in the gun, so that such gases cannot find their way along the thread into the projectile-chamber.

Our invention is not restricted to the precise construction shown and described, as the same may be modified in different particulars without departing from the spirit and scope of our invention.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a chambered projectile having a threaded opening in its base and a concentric recess, and a flanged fuse or firing plug having an annular portion on the inner face of the flange to enter and seat in said recess and seal the thread when the plug is screwed into place.
2. A chambered projectile having a threaded opening in its base and a recess concentric with said opening, a flanged fuse or firing plug adapted to be screwed into the opening, an annular projection on the inner face of the flange to enter the recess when the plug is screwed into place, and means to cause said projection and recess to form a gas-seal for the thread.
3. A chambered projectile having a threaded opening in its base and a recess concentric with said opening, a flanged fuse or firing plug adapted to be screwed into the opening, an annular projection on the flange to enter the recess when the plug is screwed into place, and means to expand the projection against the walls of the recess when the plug is screwed into place, to form a gas-seal for the thread.
4. A threaded fuse or firing plug having a flange at its outer end, and an annular projection on the inner face thereof to seat tightly in a recess in the projectile-base, to form a gas-seal for the thread.
5. A chambered projectile having a threaded opening in its base and a recess concentric with said opening and having its outer wall beveled, a fuse or firing plug adapted to be screwed into the opening, an annular projection on the plug to enter the recess when the plug is screwed into place, and sealing material introduced into the an-

nular clearance formed in the recess between the beveled outer wall thereof and the adjacent face of the projection on the plug.

6. A chambered projectile having a
5 threaded opening in its base and a concentric recess having its inner wall inwardly beveled, and a fuse or firing plug having an annular projection to enter the recess, the inner surface of said projection being beveled to en-
10 gage the inner wall of the recess and be

forced into sealing engagement therewith as the plug is screwed home.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHARLES F. COWDREY.

HENRY E. COWDREY.

Witnesses:

GEORGE B. WARNER,

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