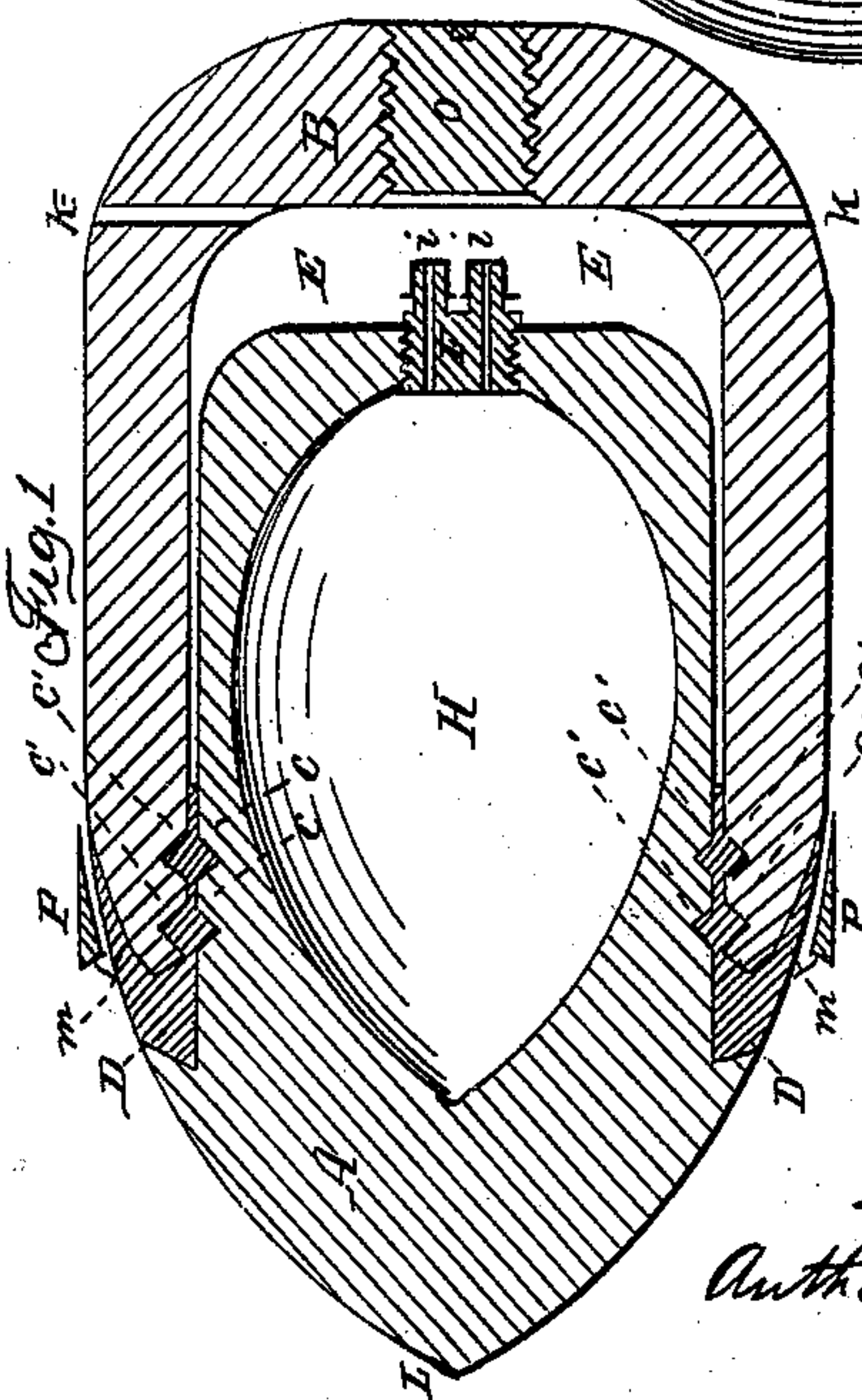
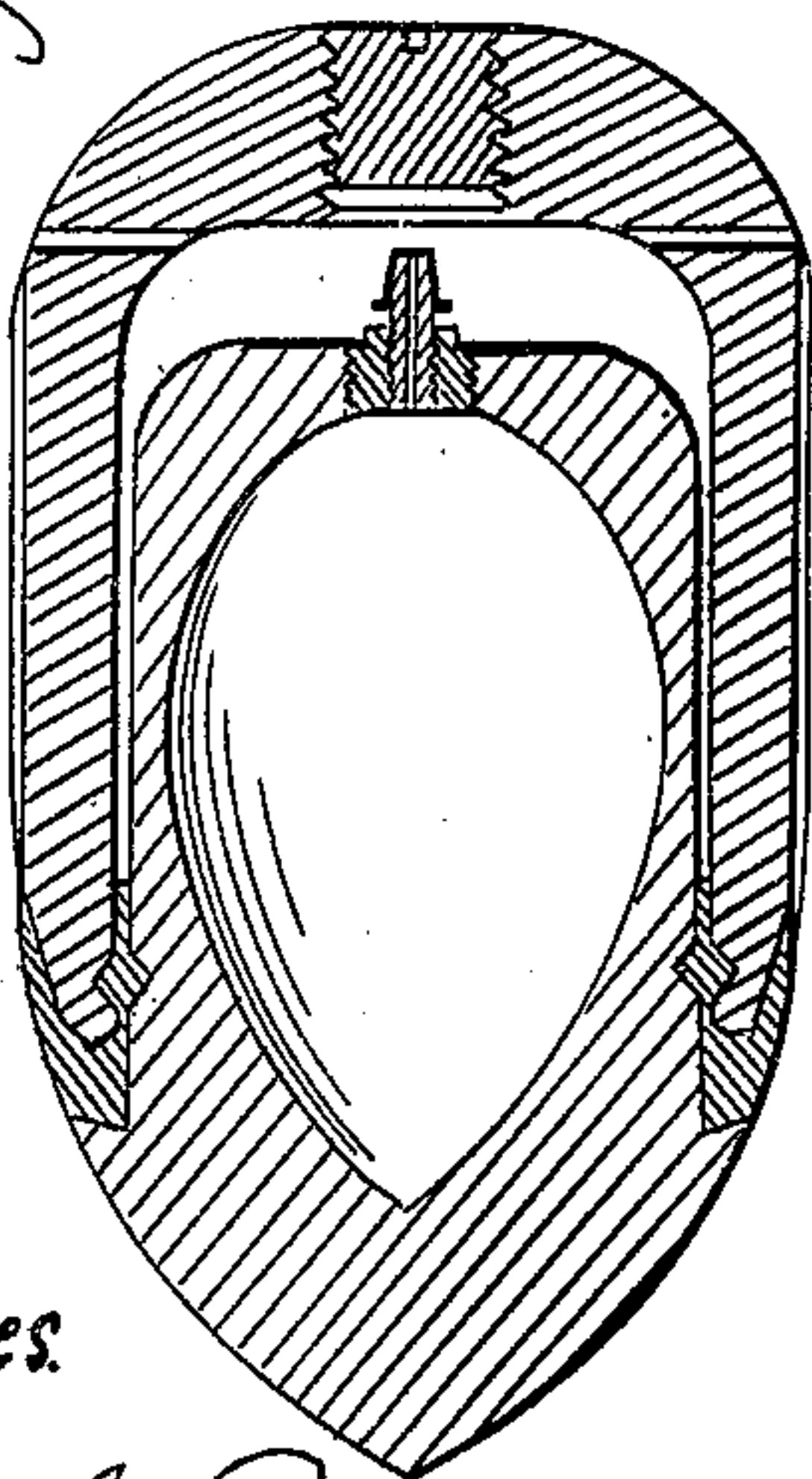
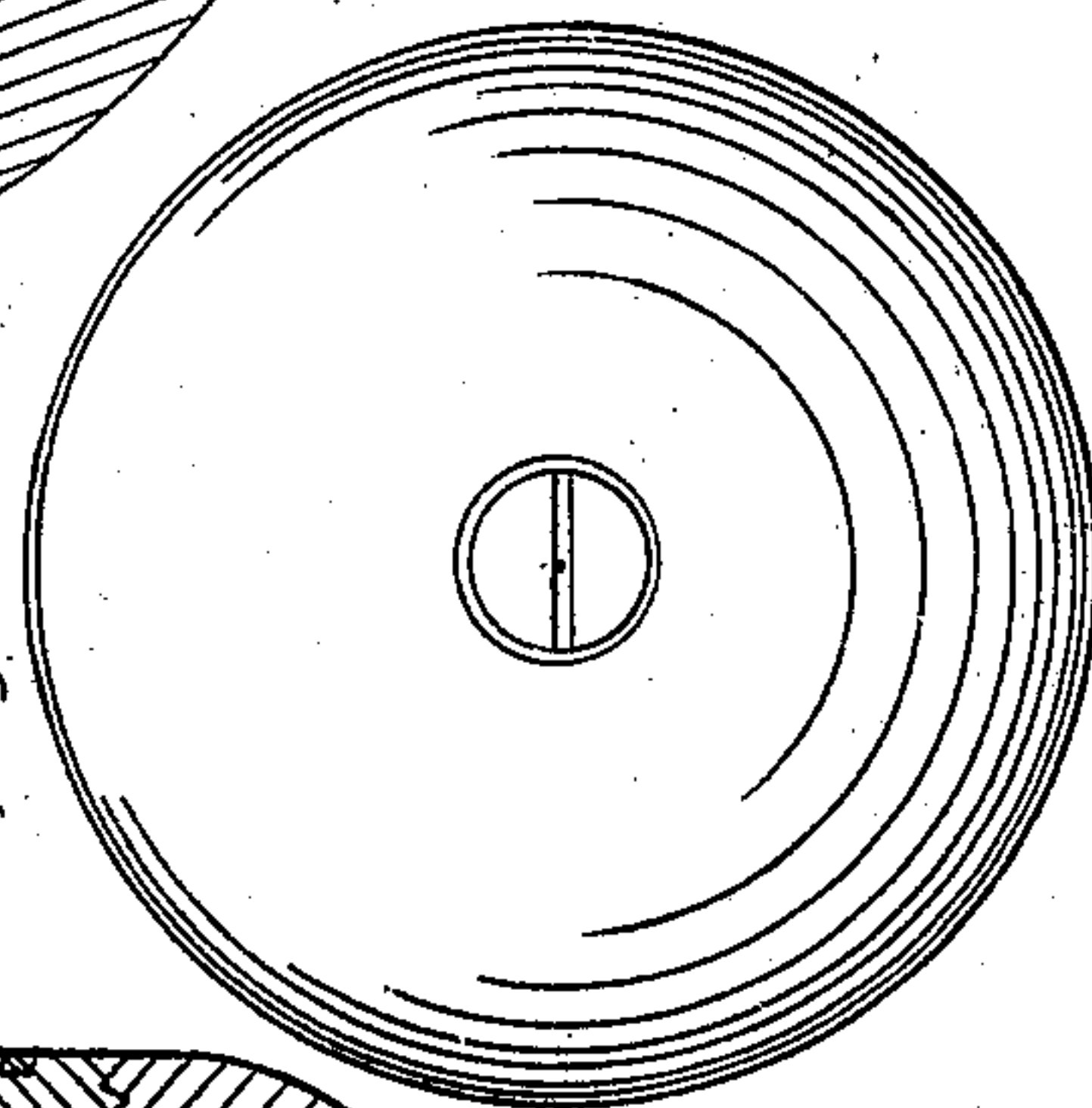
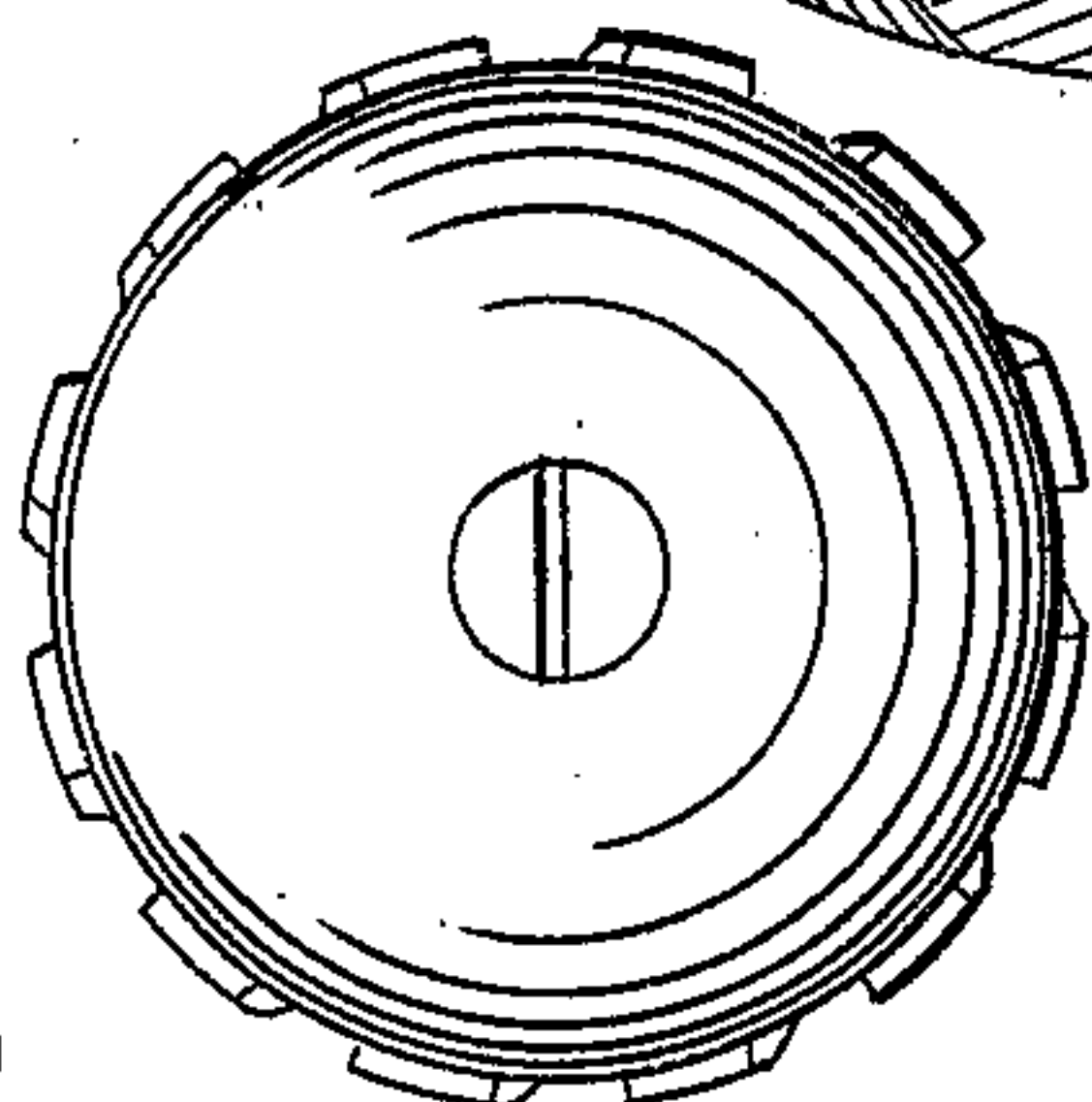


Projectile.

No. { 2,537, }
{ 33,541. }



Witnesses.

John B. Haelck
William Dealing

Inventor
Anthony Pfund

UNITED STATES PATENT OFFICE.

ANTHONY PFUND, OF NEW YORK, N. Y.

IMPROVEMENT IN SHELLS FOR ORDNANCE.

Specification forming part of Letters Patent No. 32,541, dated October 22, 1861.

To all whom it may concern:

Be it known that I, ANTHONY PFUND, of the city of New York, State of New York, have invented a new and useful Projectile for War Purposes; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 shows the longitudinal section. Fig. 2 shows the diameter or back elevation of the projectile.

The projectile, Fig. 1, consists of two principal parts made of hard metal, of oblong and pointed shape, and is intended to be used for ordinary long cannons and direct shots. The shell-shot A is a hollow cylinder of pointed contour, with cheek and grooves as shown on plan, with a hole in the back to receive a breech-screw with nipples and percussion-caps. It will be slid in the cylindrical-shaped shell B, made, as per plan, with tongue and grooves at the front part and screw and screw-hole on the back, and two air-holes on the side of it. The shell-shot A, when to be prepared to charge the same, will be slid into the shell B only so far that the grooves C and C' will meet each other, which will leave the open spaces D and E between the two principal parts of the combined projectile. The screws F and G will be taken out at the time the open space D and the grooves C C' are to be filled in with melted lead or other soft-metal composition, for the purpose of securing the two principal parts of the projectile from untimely moving. The entire space behind E will be kept free from lead. The hollow H of the shot-shell will be filled up with gunpowder or other exploding and burning materials, the screw F to be set in through the large screw-hole of G, and the screw G to be temporarily put in. The projectile is charged, but not ready, and may be put aside in such a state until to be used for the gun. At the time the projectile is to be used the screw G must be taken out and the percussion-caps *i i* carefully set up. The screw G must then be put in again, so as to leave a certain space from the percussion-caps, to prevent accidental or untimely explosion. The time will be regulated by the said screw G, so that the explosion may be a moment earlier or later after the

shell shall have struck the object required. The quantity of lead or other composition with which the shell should be secured is to be proportioned to the different sizes, weights, and shapes of the projectiles and the forces used, so as to resist the pressure to a certain degree, to make the shots more or less effective, according to the object to be destroyed. The air-holes K of the shell B will be stopped upon the surface with some clay or putty, to prevent the explosion of the shell from the fire of the discharged gun.

On discharging from a gun the projectile, as described above, the shock and force of the shell B will tend to move it on the shell A; but this will be prevented by the lead, which is inelastic, and which cannot be cast off, because grooved in. The shot A, surrounded by the shell B, has to partake of the same velocity, and in the flying state of both the lead cannot crush; but at the moment the front end, L, strikes the wall, or wood, or other hard object, the rebounding of the shot A and the momentum of the shell B will crush and cut the lead in C and D, and spread the same backward by *m*, in consequence of which the percussion-caps will strike the screw G, and the explosion of the powder in H will follow, and the projectile will do its destructive work. The confined air will escape through the air-holes.

For reducing the windage of projectiles used, a loose ring, P, made of soft metal and in wedge form, may be attached to the shell B, which, when a gun is loaded with such a projectile, will, by the discharge of the same, force in and fill the space between the ball and the bore of the gun. For shots to be used for rifled cannons the ring will be made of suitable size to fill the grooves of the gun.

The projectile is to be constructed in proportions varying according to different requirements. The center of gravity of the same is to be set a little in front of the center of the ball, to prevent the shot from turning over after being discharged from the gun.

The resistance of the lead in the grooves between the shells may be increased by mixing tin, zinc, antimony, &c., for projectiles of large dimensions, for the purpose of delaying the explosion when the ball strikes, so that the projectile may be forced into the body of the object.

The point L or front part of the shot A is of such shape that the breach opened by it will be large enough to let the shell B pass without touching, so that the crushing of the lead and the explosion of the shell will follow inside of the penetrated body, and because the powder is fired from the back part of the shell its fragments will be thrown forward into the body of the object, contrary to the Sawyer projectile, which explodes from the striking-point, and consequently throws the fragments backward from the object.

Fig. 3 of the drawings represents a ball with flanges for rifled cannon, and Fig. 4 the section of a spherical bomb-shell, to be thrown by a mortar, all to be constructed on the same principle as the above specified projectile. The bomb-shell, Fig. 4, should have a fuse, in addition, to act when the shell is to be exploded in the open air, or when it may fall into soft ground and not explode by the percussion-caps.

I claim as my invention and desire to secure by Letters Patent—

The construction of projectiles for different guns made of different sizes, and of shapes according to the principles set forth in the above specification, to consist of two principal parts of shells united and secured together with lead or other soft-metal composition, and arranged in such manner that the surrounding outside shell forms the hammer to the nipple and percussion-cap, or nipples and caps, attached to the inside shell, which shell, when charged with powder or other exploding materials and shot from a gun, will explode at the time when the projectile strikes a suitable object, in the manner herein set forth.

ANTHONY PFUND.

Witnesses:

JOHN M. HELEK,
WILLIAM DEALING.