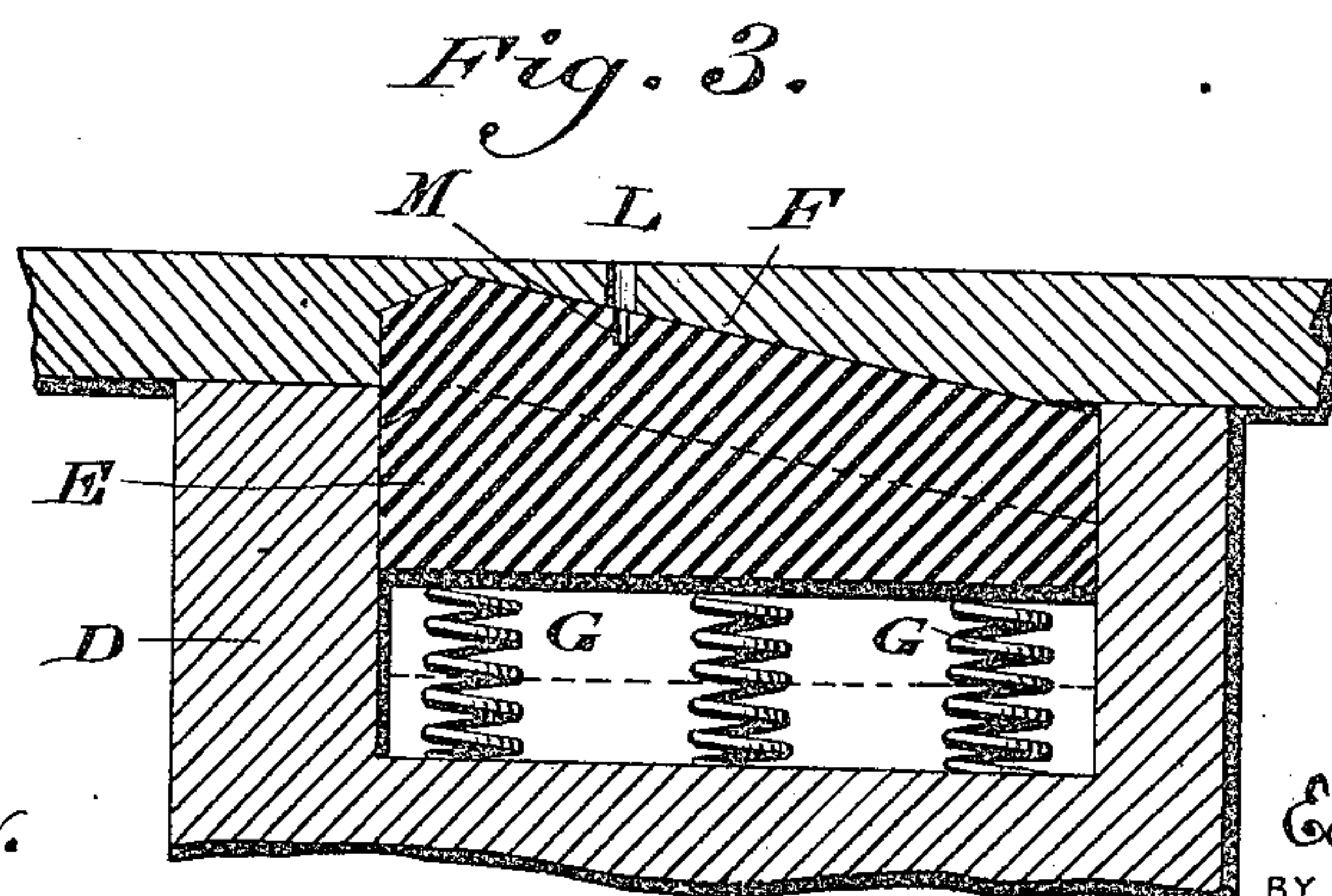
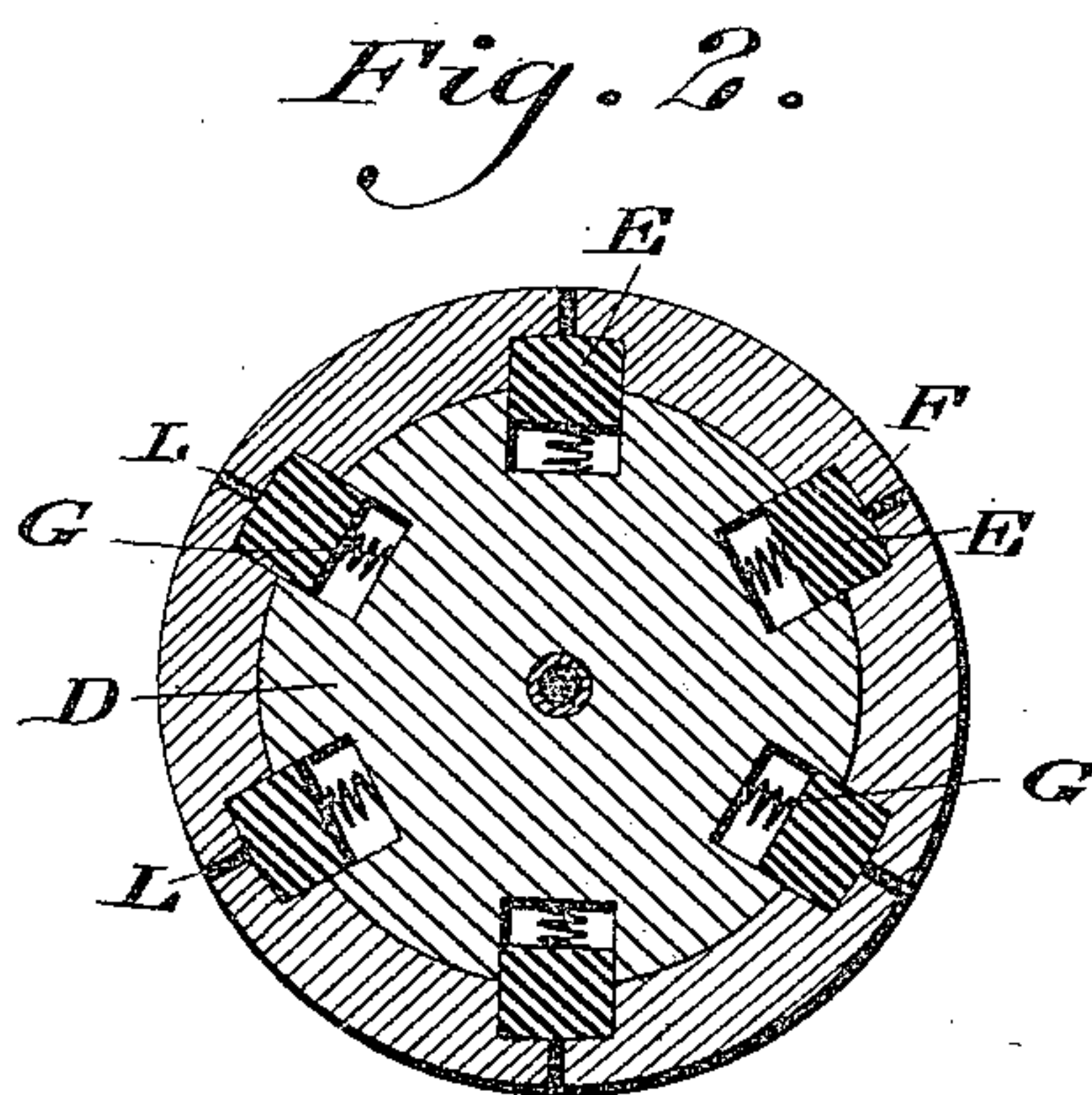
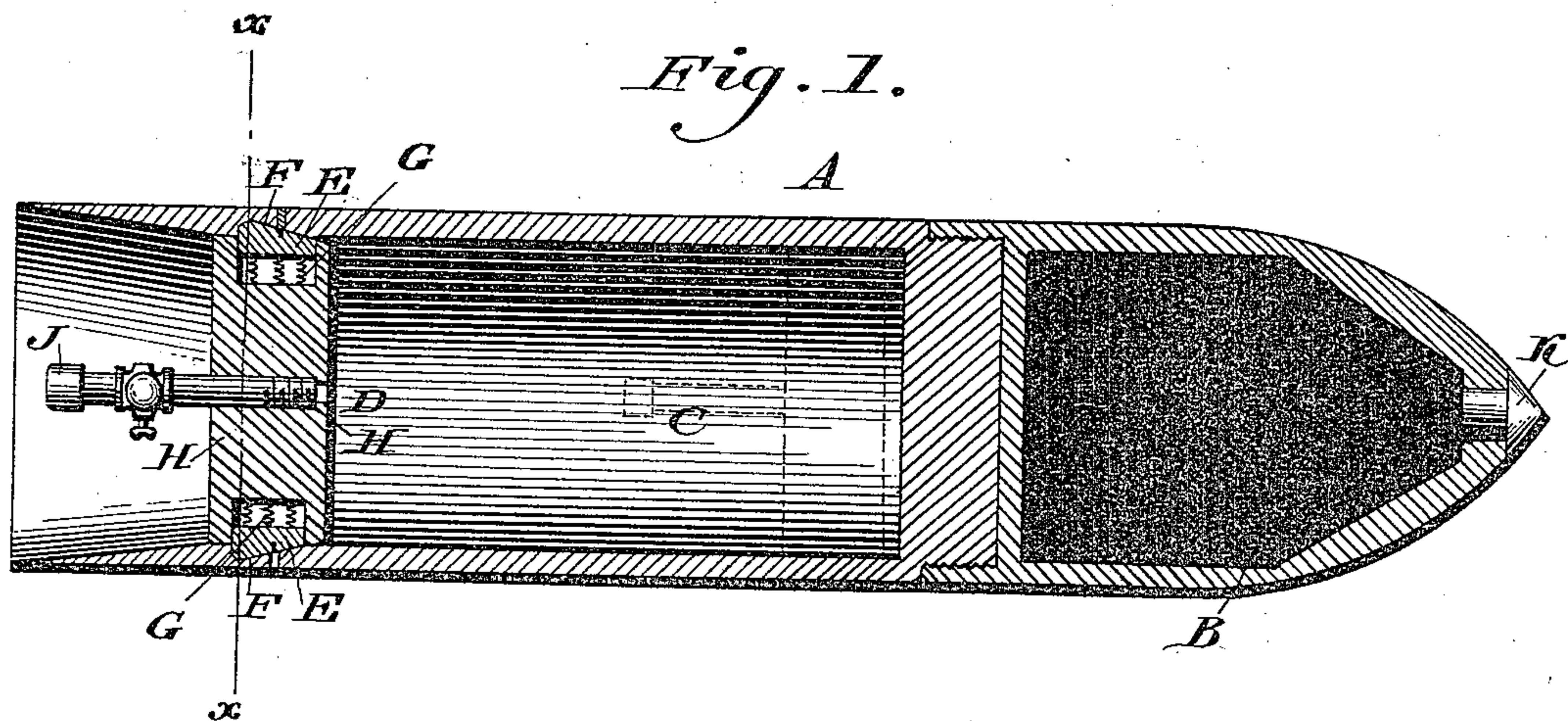


(No Model.)

E. STERN.
DYNAMITE SHELL.

No. 424,736.

Patented Apr. 1, 1890.



WITNESSES:

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UNITED STATES PATENT OFFICE.

EDWARD STERN, OF PHILADELPHIA, PENNSYLVANIA.

DYNAMITE-SHELL.

SPECIFICATION forming part of Letters Patent No. 424,736, dated April 1, 1890.

Application filed April 1, 1889. Serial No. 305,580. (No model.)

To all whom it may concern:

Be it known that I, EDWARD STERN, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Projectiles for Dynamite, &c., which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of a projectile for dynamite, nitro-glycerine, or other high explosive, providing means whereby the shock due to the explosion of the charge of gunpowder or other explosive or pressure used in the discharge of a projectile from a cannon is reduced or in great part avoided, thus lessening the danger of explosion when shells filled with nitro-glycerine or other high explosive are employed.

The invention also reduces the sudden shock which tends to burst the explosion-chamber of the cannon, and may be employed in the firing of solid shot, as well as of shells containing high explosives.

It also consists of details of construction, as will be hereinafter set forth.

Figure 1 represents a longitudinal section of a projectile embodying my invention. Fig. 2 represents a transverse section on line $x x$, Fig. 1. Fig. 3 represents a longitudinal section of a portion on an enlarged scale.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates a projectile of suitable form, having a chamber B for dynamite or other high explosive and a chamber C rearward of said chamber B, the chamber C being fitted with mechanism so as to form an air-cushion between the seat of the explosion of the powder or other pressure used in the gun and the chamber B, said mechanism consisting of a plunger or piston D, which occupies a position near the breech end of the chamber C, said piston having fitted in its periphery the movable plugs or tongues E, which are adapted to enter the grooves F in the inner periphery of the chamber C and are forced into said grooves by the springs G.

The plunger D can be provided with any efficient system of packing or other known device or construction for preventing the pas-

sage of the air or other gas between its sides and the sides of the chamber C.

Within the plug is a port H, with which communicates a pipe J on the outside of said plug, whereby suitable material—such as a heavy oil—can be introduced into the chamber C for facilitating the sealing or packing of the joint between the plunger D and the contiguous wall of the chamber C; or the packing material may be introduced in a plastic state around the circumference of the plunger D before its introduction into the chamber C, and afterward by the application of heat it may be brought to fill the groove shown in the drawings.

In the wall of the chamber C are perforations L, and in the tongues E are smaller holes or channels M for receiving a pin or other implement, in order to facilitate the springing of the tongues E into the grooves F, after which said perforations L may be closed by metallic plugs or screws.

The chamber C, being made as air-tight as is found practicable, can (before being placed in the cannon) be charged with air or other gas through the port H, which communicates with the pipe J. The pressure within the chamber can be raised to such a point as is found in practice to form the best air-cushion, for the purpose of decreasing the shock communicated in the usual method of discharge, it being observed that the mechanism securing the plunger D in position is of such character as will enable it to resist pressure from within the chamber C while it retains its primary position, and yet permit its free entrance farther within the chamber as soon as the pressure resulting from the powder or other explosive agent used in the discharge of the cannon exceeds the pressure within the chamber C. The mechanism of said plunger is also of such character as to facilitate the free exit of the plunger from the chamber C after the projectile leaves the cannon—that is, the plug, being relieved from the pressure from behind and subject to the great pressure from within the chamber C, will be driven rearward from the dotted position in which it is shown and out of chamber C.

The rear or breech of the projectile is reduced in thickness from or about the plug D

to the outer edge, whereby when the projectile is discharged said rear end will expand, and thus close against the bore of the fire-arm.

5 The point of the projectile is provided with a cap K, whereby the dynamite or other material within the chamber B may be duly exploded; or any approved form of fuse may be employed to produce explosion at the desired point.

10 The exterior of the projectile, more especially the chamber C, may be clad or sheathed with soft ductile metal, thus enabling the wall of said chamber to better resist the strain to which it may be subjected and engage with
15 the rifling of the bore of a gun or fire-arm when so constituted.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

20 1. A projectile having a front chamber for highly-explosive material, an air-chamber in the rear thereof, with a movable plunger forming the rear wall of the air-chamber, said parts being combined substantially as described.

25 2. A projectile having a front chamber for highly-explosive material, an air-chamber in the rear of said highly-explosive-material

chamber with fixed wall between the same, and a plunger at or near the breech end of the projectile, and having movable plugs fitted in its
30 periphery and adapted to enter grooves in the air-chamber, said parts being combined substantially as described.

3. A projectile having the explosive-material chamber B, the air-chamber C in the rear
35 of said explosive-material chamber and having the grooves F in its inner periphery, the plunger D, with opening H and pipe J, and the plugs E, with springs G, said plugs being fitted in the periphery of the plunger and
40 adapted to enter the grooves F, said parts being combined substantially as described.

4. A projectile having an air-chamber, with the grooves F and the openings L in its walls, the plunger D at or near the breech end of
45 the projectile, and the movable plugs E, fitting in the periphery of the plunger and entering the grooves F, the said openings L being opposite to the said plugs E, said parts being combined substantially as described.

EDWARD STERN.

Witnesses:

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JAMES F. KELLY.