

Thomas Hill. Imp^t. in Projectiles.

117172

Fig. 1.

PATENTED JUL 18 1871

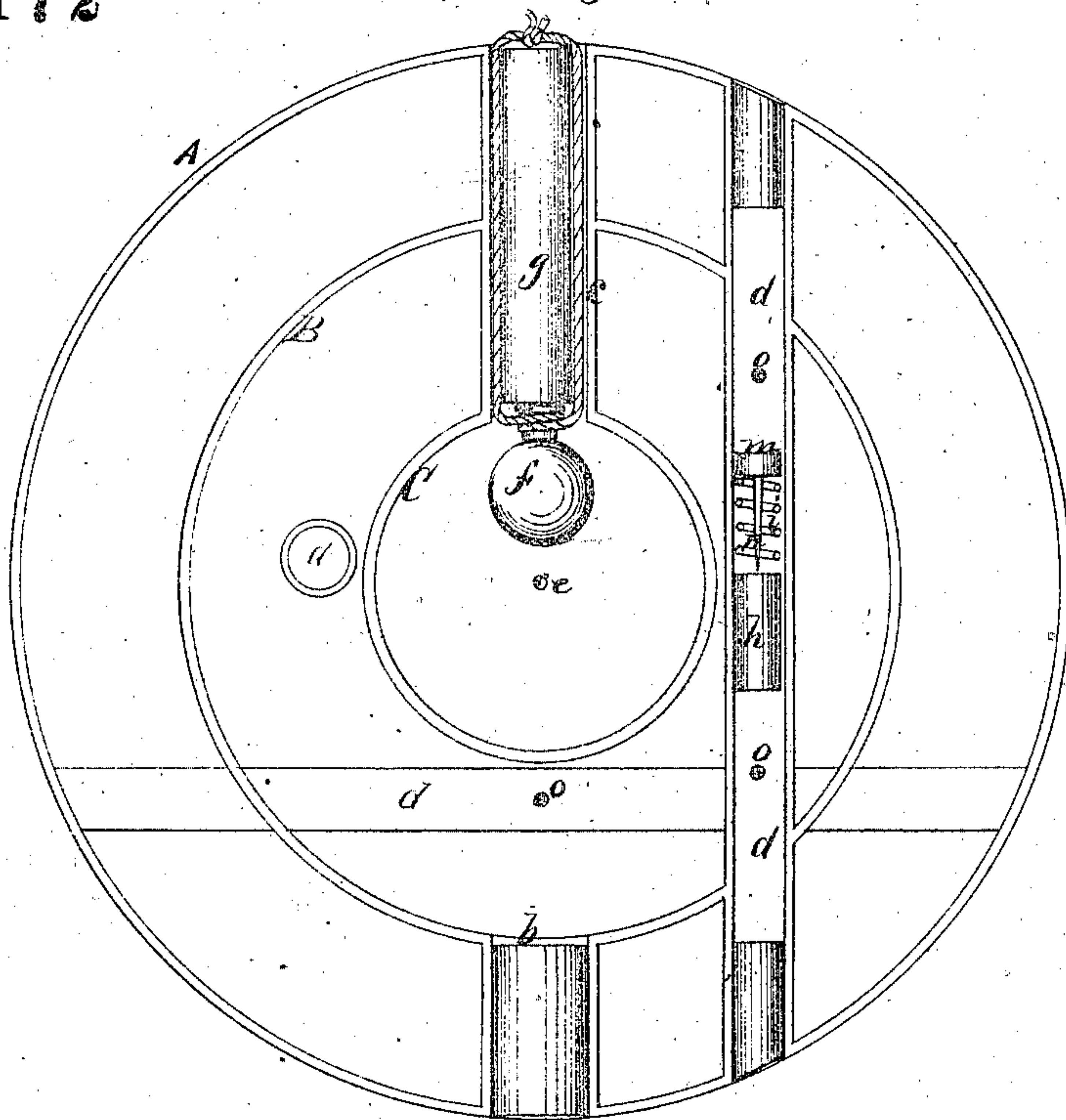
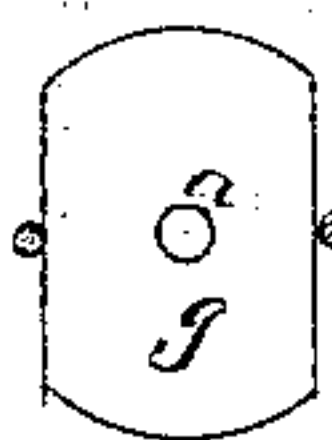
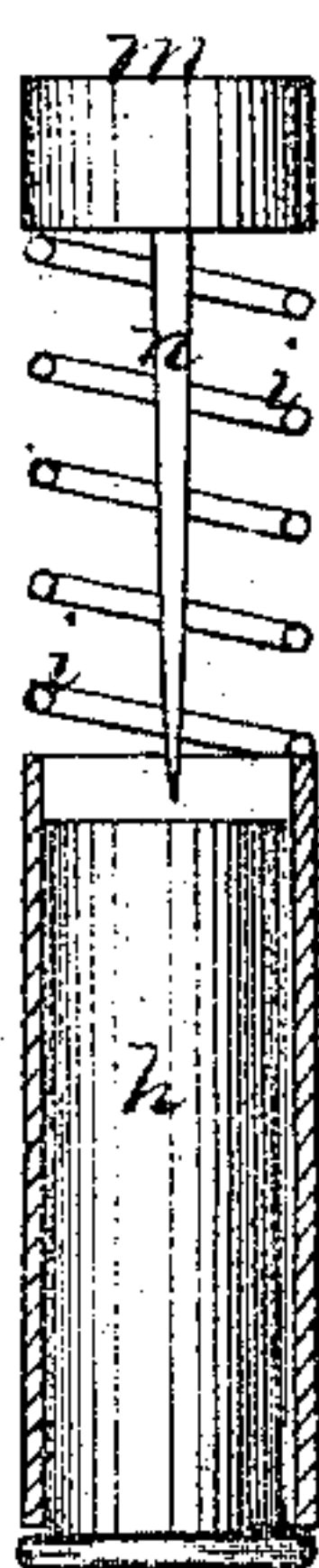


Fig. 2.



Witnesses.
Geo. H. Strong.
Chas. Brown

Inventor.
Thomas Hill
By his atty's
Dewey & Co.

UNITED STATES PATENT OFFICE.

THOMAS HILL, OF VALLEJO, CALIFORNIA.

IMPROVEMENT IN PROJECTILES.

Specification forming part of Letters Patent No. 117,172, dated July 18, 1871.

To all whom it may concern:

Be it known that I, THOMAS HILL, of Vallejo, county of Solano, State of California, have invented an Improvement in Projectiles; and I do hereby declare the following description and accompanying drawing are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvement without further invention or experiment.

The object of my invention is to provide an improvement in that class of projectiles which is employed in gunning; and it relates more particularly to the construction of shells, the manner of charging, and the devices for exploding the same. The projectile consists of two or more concentric shells, one within the other, so arranged that one shall contain the bursting charge, while the other one is loaded with balls or scraps of metal. If a third one is employed, it is placed the innermost of all, and serves to contain a small vial of liquid fire or other igniter which will be broken by the concussion when the shell strikes, and thus ignite the charge through small openings, as shown. Tubes may be arranged to extend through the shell from side to side, in two or three different directions, and a small fulminating-shell is placed in each, having a spring and needle so placed that, when the shell strikes, one or other of the different fulminates shall be exploded by the concussion and ignite the charge. This latter device is also applicable to conical shells.

Referring to the accompanying drawing for a more complete explanation of my invention, A, B, and C are three concentric shells, cast of suitable thickness, proportioned to the size, and supported and stayed by braces, which may be introduced when the shell is molded. An opening is made directly into the outer shell. A short tube, *b*, opens into the shell B, and a tube, *c*, connects the inner shell C with the outside. These tubes and tubes *d*, to be hereafter described, may be so introduced as to serve as braces instead of rods. The shell B is charged with the powder necessary to explode it. The outer shell A may be filled with balls, scrap-iron, or other missiles, and the inner shell C is left empty, but has small holes *e* made for communication with the shell B.

In order to explode this projectile, I employ one or both of two devices, which I will now de-

scribe: *f* is a small bottle, of zinc, glass, or any substance which will move about ordinarily with safety, but which can be broken by violent concussion. This bottle is filled with liquid fire or other inflammable substance and corked tightly. The bottle *f* is then made fast by a string to the end of a wooden plug, *g*, which is flattened at the sides to admit air, and which fits tightly in the pipe *c*. Into this pipe it is placed so that the bottle is suspended within the inner shell C. The bottle is released by the flame of the discharge, which burns the string and it is suffered to roll loosely within the shell. When the projectile strikes any object after being discharged the concussion will break the bottle or force the cork out by compression and the bursting charge in the chamber B will be ignited through the small holes *e*. A hole, *a*, is made through the plug *g*, so that, if desired, an ordinary time-fuse may be used. To secure a greater certainty of explosion I make the projectile with two or three or more tubes, *d*, passing entirely through the chambers A and B outside of the inner one C, and in different directions, so that in whatever position the shell strikes some one of the tubes will stand with its axis in the direction of the line of motion. Within each of the tubes *d* I place a small fulminating-shell, *h*, which will slide easily from end to end. To one end of this shell is affixed a spring, *i*, and a small weight, *m*, is fastened to the outer end of the spring. A needle or firing-pin, *n*, extends from the weight so as to touch or nearly touch the shell *h*, and when the projectile strikes an object the device just described will slide forcibly to one end of its tube and the spring *i* will be compressed enough to allow the pin *n* to pierce the shell *h*, and thus fire the bursting charge in the large shell B through the holes *e*. All of the tubes *b*, *c*, and *d* are closed from the outside by suitable wooden plugs, as shown.

Either one or both of the devices described may be employed in concentric shells, and the one last described may be used in elongated projectiles. When the latter only is employed in concentric shells the inner chamber may be dispensed with, if desired.

I am aware that bottles have been inclosed within projectiles and so arranged as to be broken by the explosion of some fulminate; hence I do not claim, broadly, the use of bottles inclosed in projectiles; but

What I claim as new, and desire to secure by Letters Patent, is—

1. The bottle *f*, containing the igniting-fluid, in combination with the plug *g* to which it is attached, substantially as described.

2. The tubes *d*, extending entirely through the chambers A and B and outside of the inner one C, and touching the outer surface of the projectile at various points, so that, in whatever position the shell strikes, some one of the tubes will stand

with its line nearly in the direction of the line of motion, substantially as set forth.

In witness that the above-described invention is claimed by me I have hereunto set my hand and seal.

THOMAS HILL. [L. s.]

Witnesses:

GEO. H. STRONG,
CHARLIE BROWN.