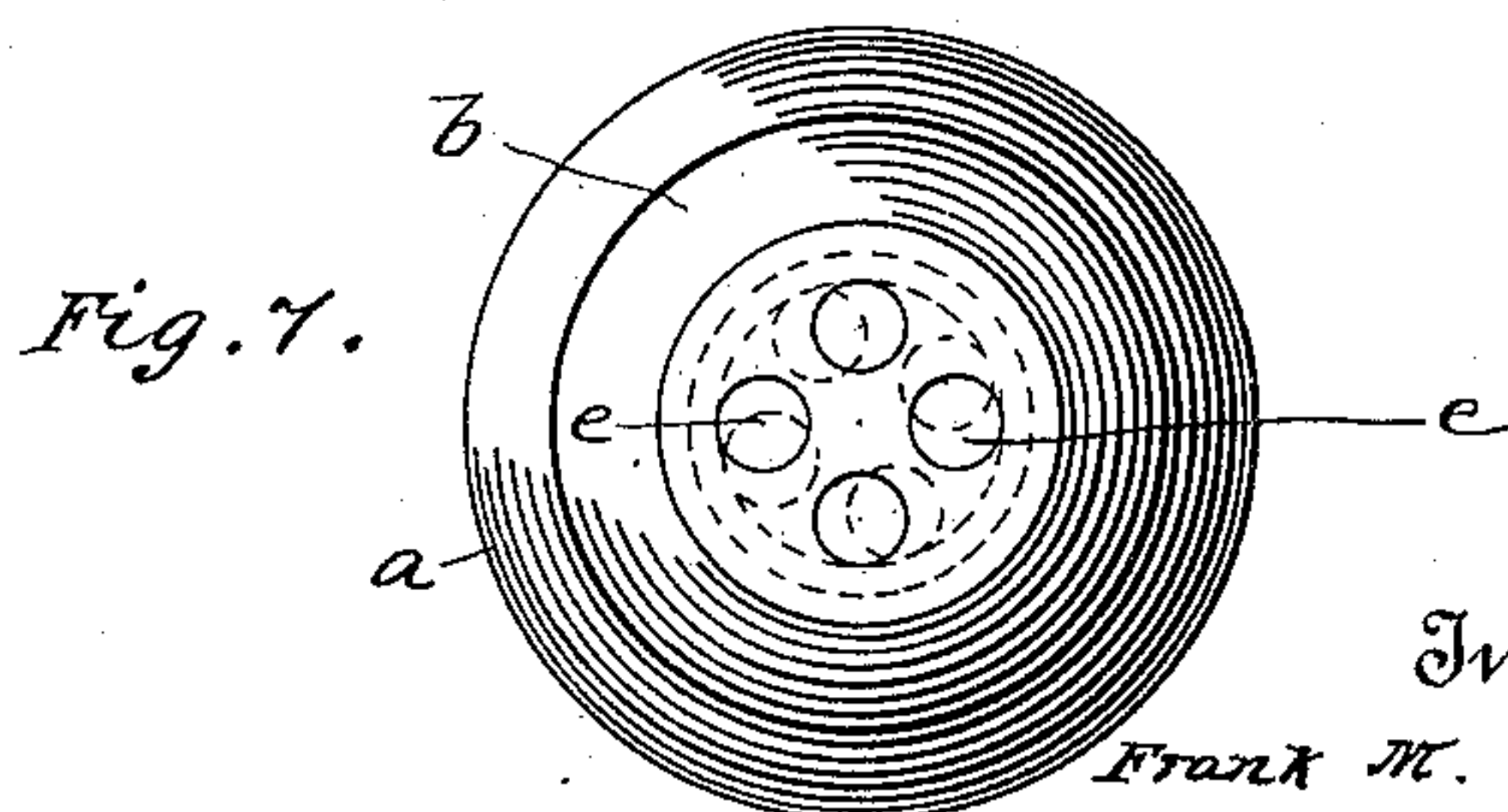
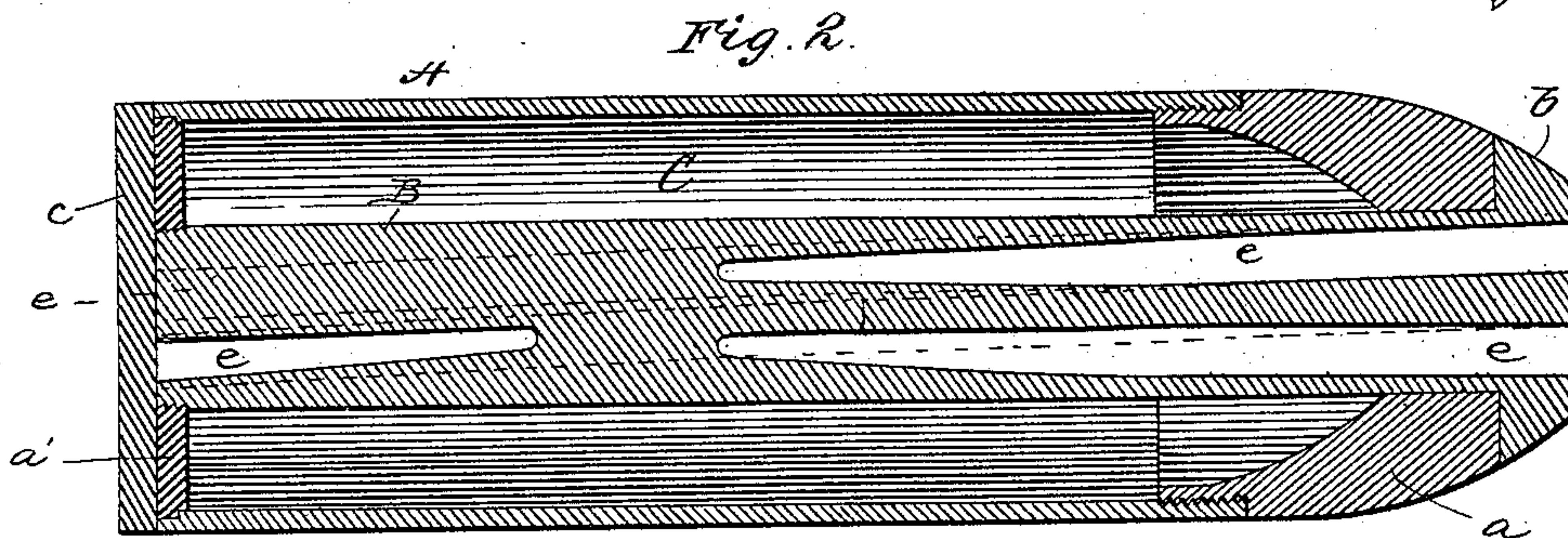
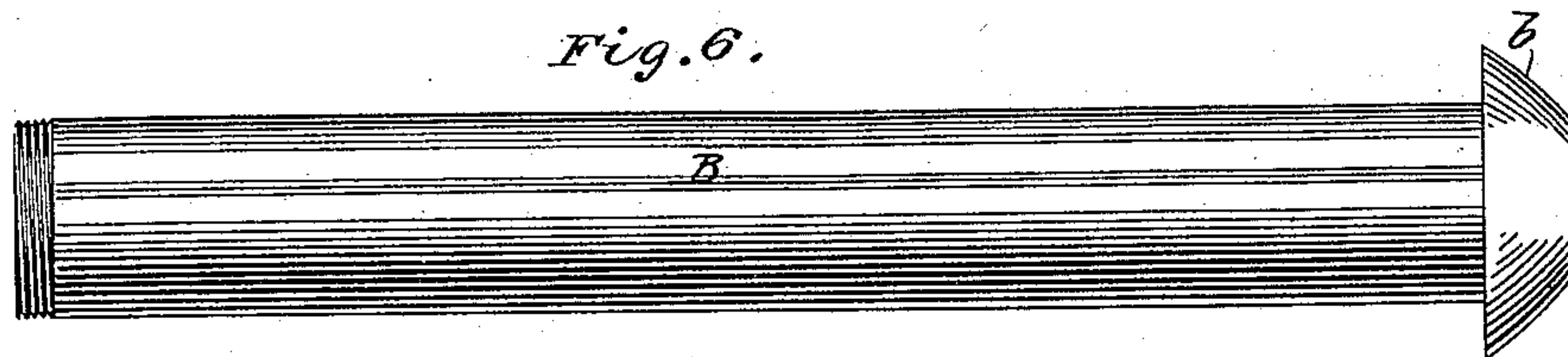
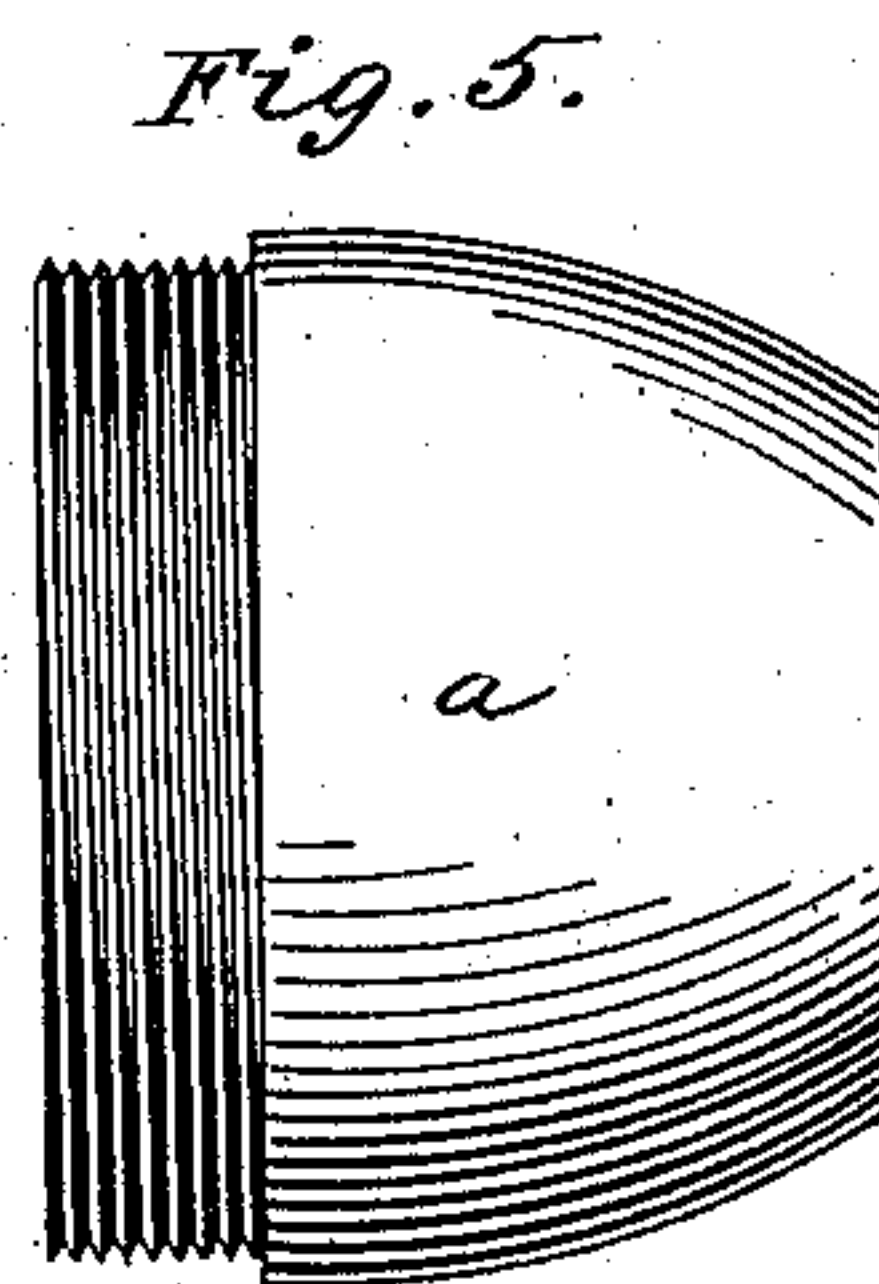
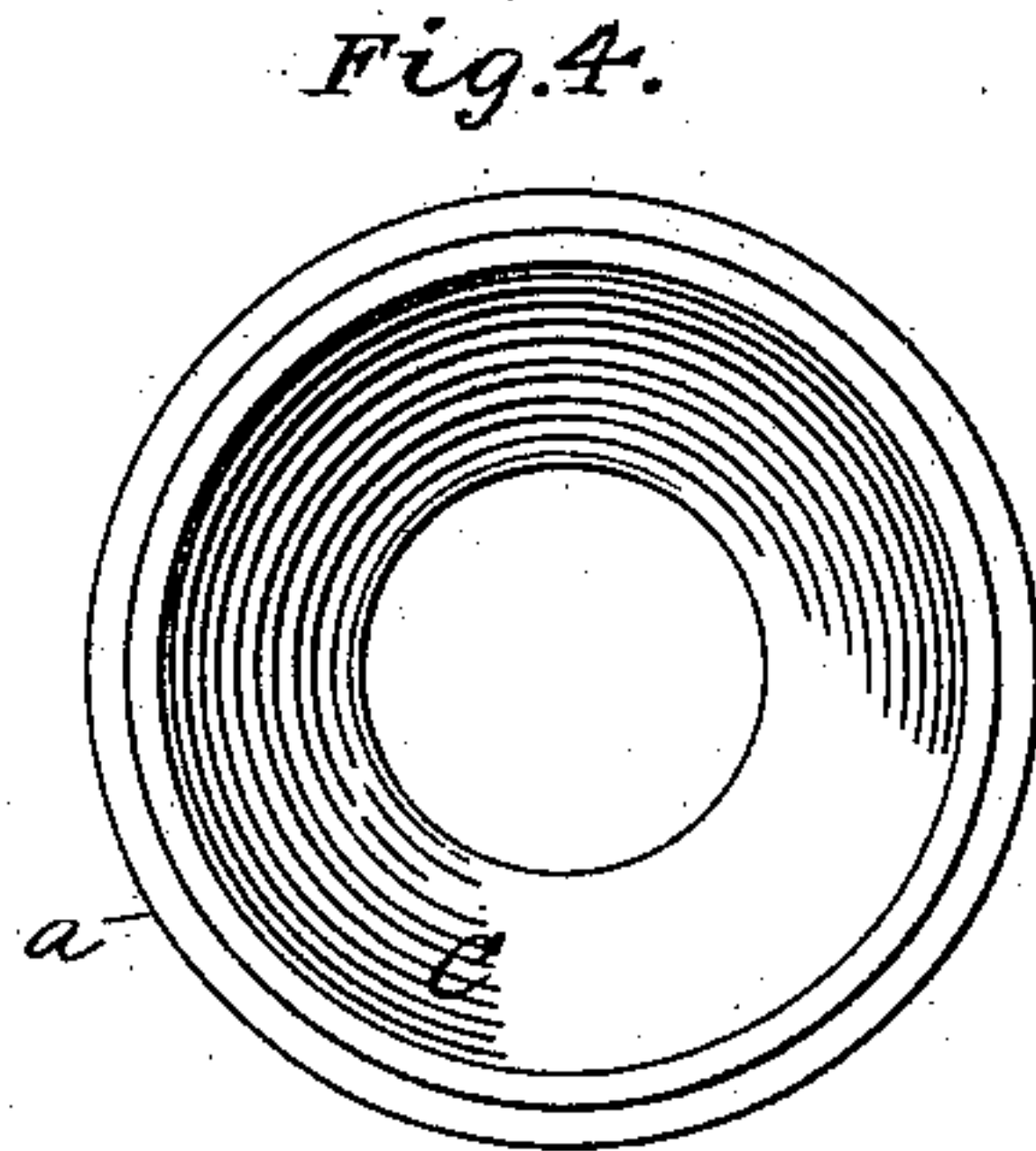
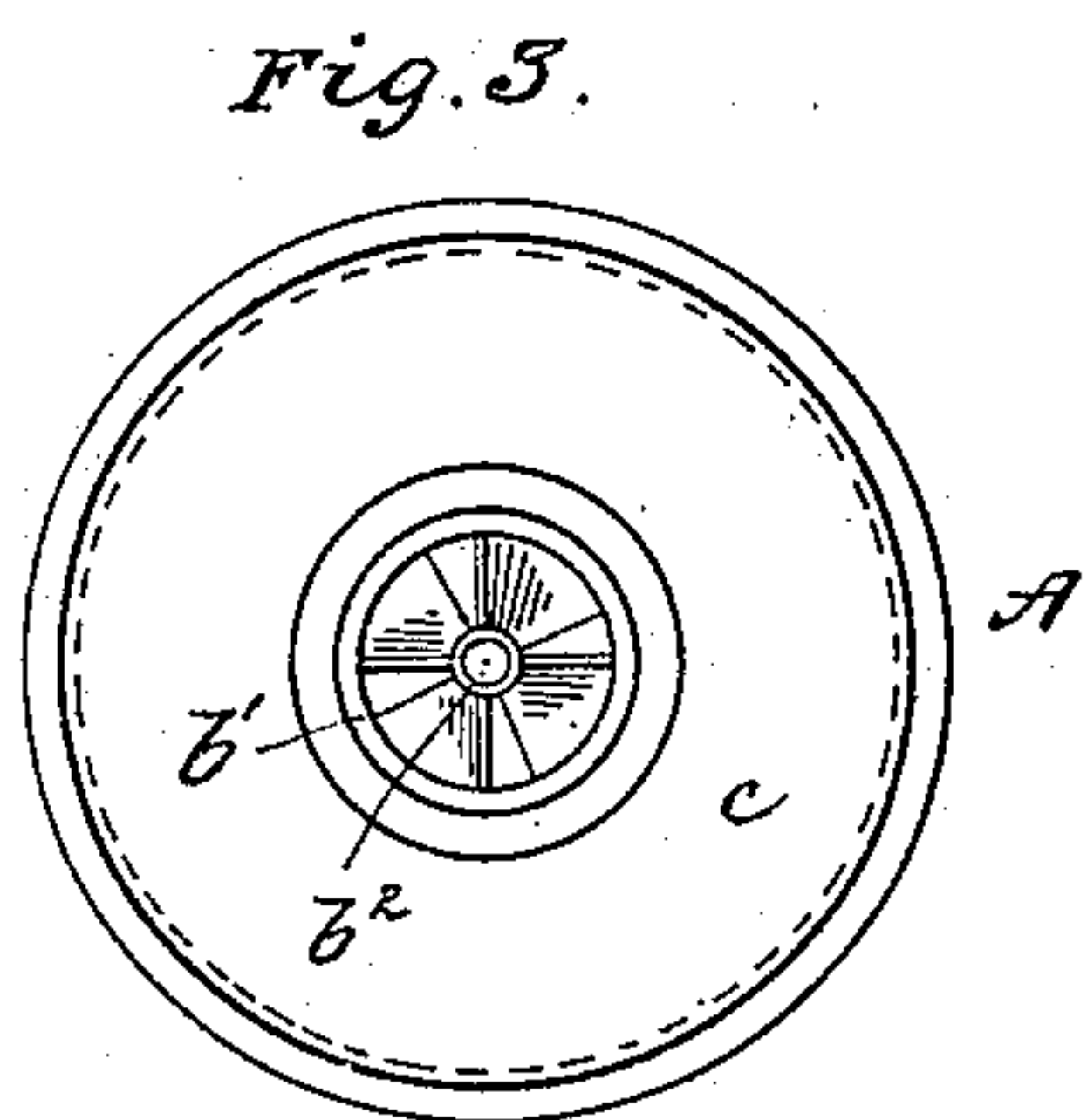
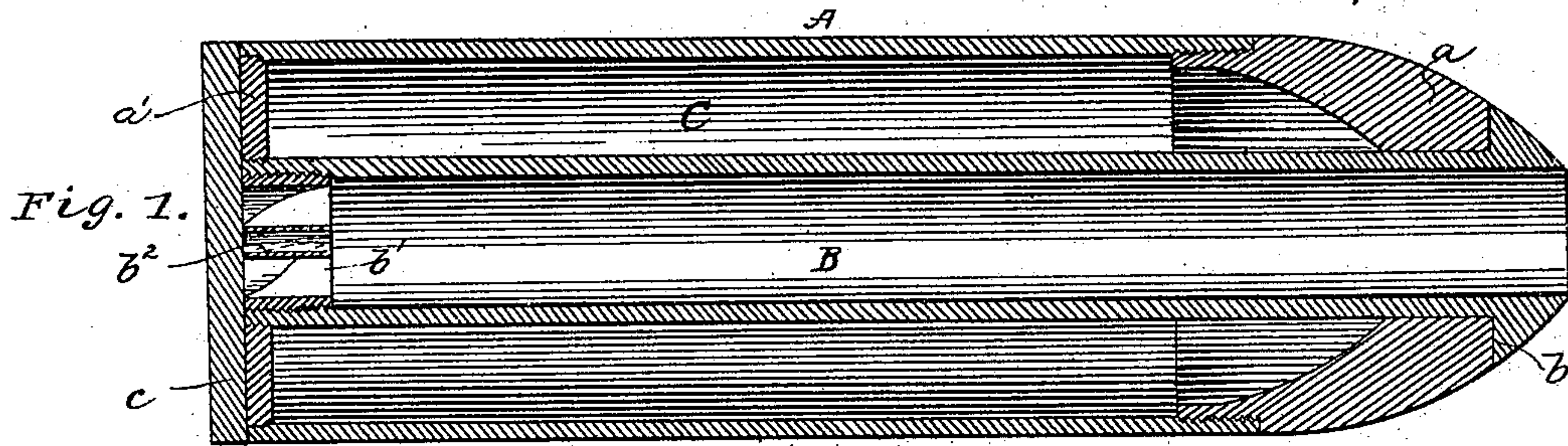


(No Model.)

F. M. ASHLEY.  
PROJECTILE.

No. 486.657.

Patented Nov. 22, 1892.



Witnesses  
Frank S. Ober  
James J. Karanagh.

Inventor:  
Frank M. Ashley -  
By his Attorney  
Wm. A. Rosenbaum



# UNITED STATES PATENT OFFICE.

FRANK M. ASHLEY, OF HAWTHORNE, ASSIGNOR OF ONE-HALF TO WARREN WOOD, OF PATERSON, AND WM. A. ROSENBAUM, OF JERSEY CITY, NEW JERSEY.

## PROJECTILE.

SPECIFICATION forming part of Letters Patent No. 486,657, dated November 22, 1892.

Application filed February 29, 1892. Serial No. 423,108. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK M. ASHLEY, a citizen of the United States, residing at Hawthorne, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Projectiles, of which the following is a specification.

This invention pertains to projectiles, and has special reference to projectiles which carry an explosive material to be discharged by concussion when the projectile strikes.

The object of the invention is to provide a projectile capable of carrying a large quantity of the explosive material in comparison with its size, and also a construction which will insure the projectile taking a straight course.

The invention consists of the details of construction, which will hereinafter be described and claimed.

Referring to the accompanying drawings, Figure 1 is a longitudinal section of my improved projectile. Fig. 2 is a similar view of a modification of the same. Fig. 3 is a rear view of the projectile. Fig. 4 is a rear view of the head. Fig. 5 is a side elevation of the head. Fig. 6 is a side elevation of the central tube, and Fig. 7 is a front view of the projectile.

Referring to the drawings by letter, A represents the body or shell of the projectile. It is hollow and cylindrical in shape. At the forward end this cylinder has fitted to it by screw-threads a head *a*, the walls of which are made quite thick in order to give weight to the forward end of the projectile. This end has an axial opening of a diameter equal to or a little less than the radius of the shell. The rear end of the cylinder is closed by a disk *a'*, which makes a close fit with the edges of the cylinder A, and is provided with a central opening equal in diameter to the opening in the head *a*.

B represents a tube open at both ends and extending entirely through the shell with its axis coincident with the axis of the shell. The ends of this tube are fitted, respectively, into the head *a* and the disk *a'*, the latter connection being by screw-threads. The for-

ward end of the tube has a flange *b*, which rests against the forward part of the head *a* and forms an abutment for the projectile. The rear end of the tube is internally screw-threaded for a short distance, as shown, and a cylinder *b'* is screwed into it until it is flush with the rear end of the shell. This cylinder has formed within it four propeller-blades, which extend radially from a tubular shaft *b<sup>2</sup>* to the inner walls of the cylinder.

*c* represents a disk having the same diameter as the projectile to bear against its rear end, entirely covering it. The explosive material—such as dynamite—is to be placed in the annular chamber C between the tube B and the outer shell A.

When the projectile is to be fired from a gun, the disk *c* is inserted between the rear end of the shell and the powder which is to impel the projectile. The object of the disk is to receive the force of the explosion and prevent the escape of gases through the central tube. As soon as the projectile leaves the gun the rush of air through the tube knocks off the disk, and striking the blades of the propeller in the rear end of the tube, rotates the shell at a high speed, and thus imparts to it the tendency to take a straight course. The forward end of the projectile being weighted, also aids in directing the projectile.

In Fig. 2 I have shown a modification of the invention, consisting in making the tube solid and perforating it throughout its entire length with a number of spiral holes *e*, which act in the same manner upon the shell as the propeller located at the rear. I, however, prefer the form shown in Fig. 1.

Having thus described my invention, I claim—

1. A hollow projectile provided with an axial tube open at both ends and provided at its rear end with a device for rotating the shell as it travels through the air.

2. A hollow projectile having a tube extending axially through it, said tube being open at both ends, in combination with fixed propeller-blades located at the rear end of said tube, for the purpose set forth.

3. The combination, with a shell A, a perforated head  $a$ , and a perforated disk  $a'$ , of a central tube B, having its bearings in the head and disk and provided with a set of fixed  
5 wings or blades to be acted upon by air, for the purpose set forth.

In witness whereof I have hereunto signed

my name in the presence of two subscribing witnesses.

FRANK M. ASHLEY.

Witnesses:

FRANK S. OBER,  
JAMES F. KAVANAGH.