

No. 667,407.

Patented Feb. 5, 1901.

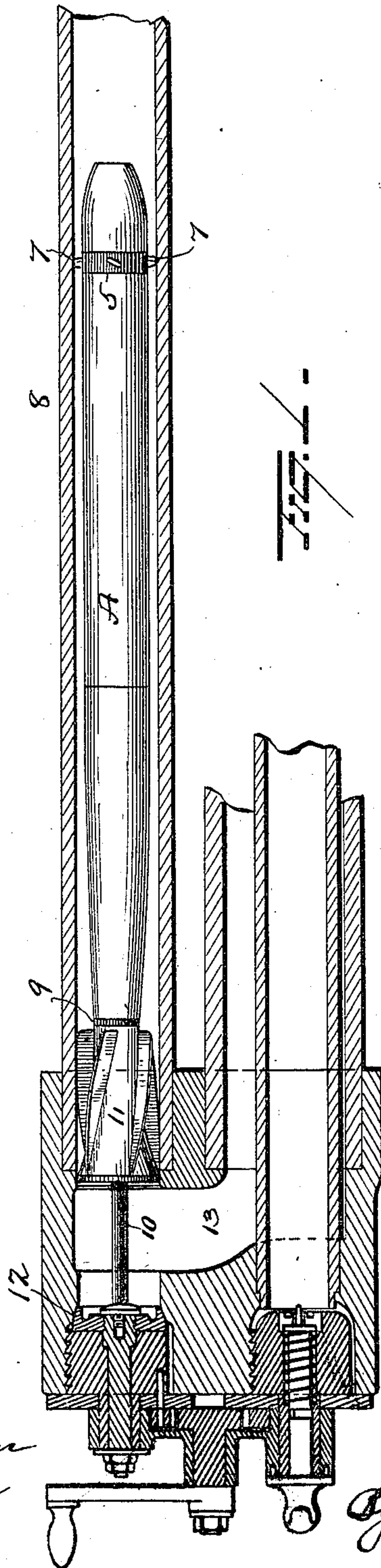
W. S. SIMS & H. P. MERRIAM.

PROJECTILE.

(Application filed Mar. 17, 1900.)

(No Model.)

3 Sheets—Sheet 1.



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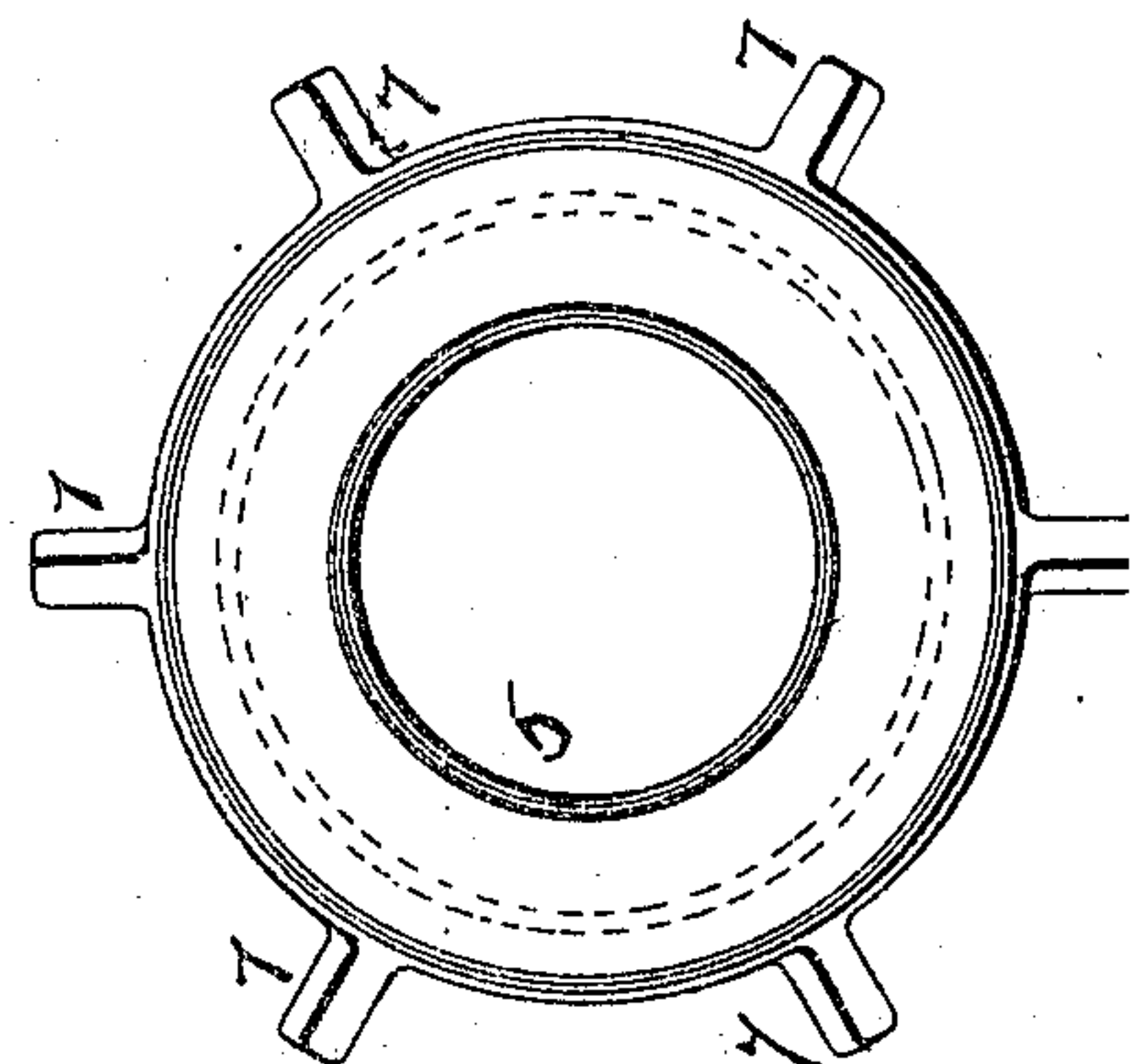
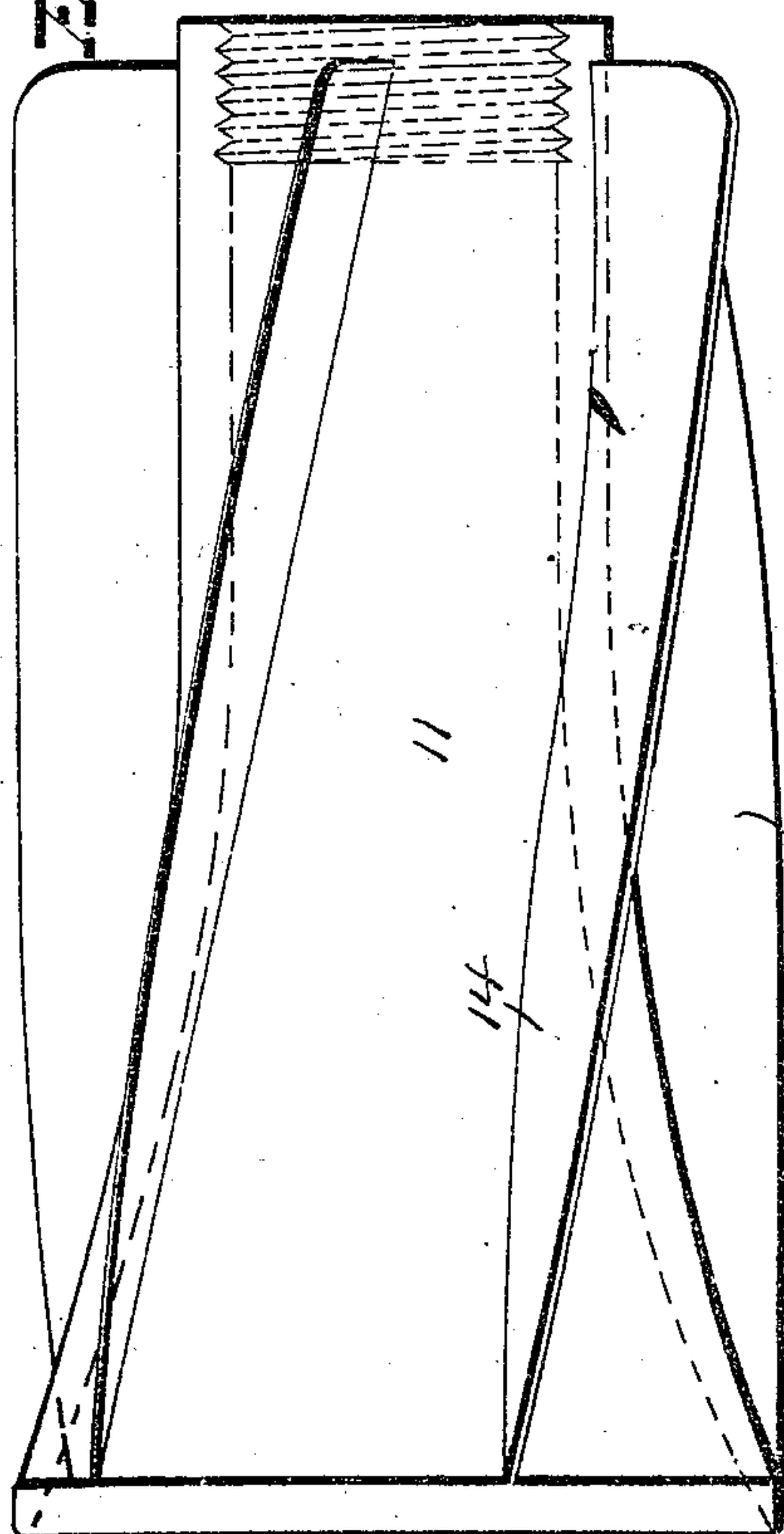
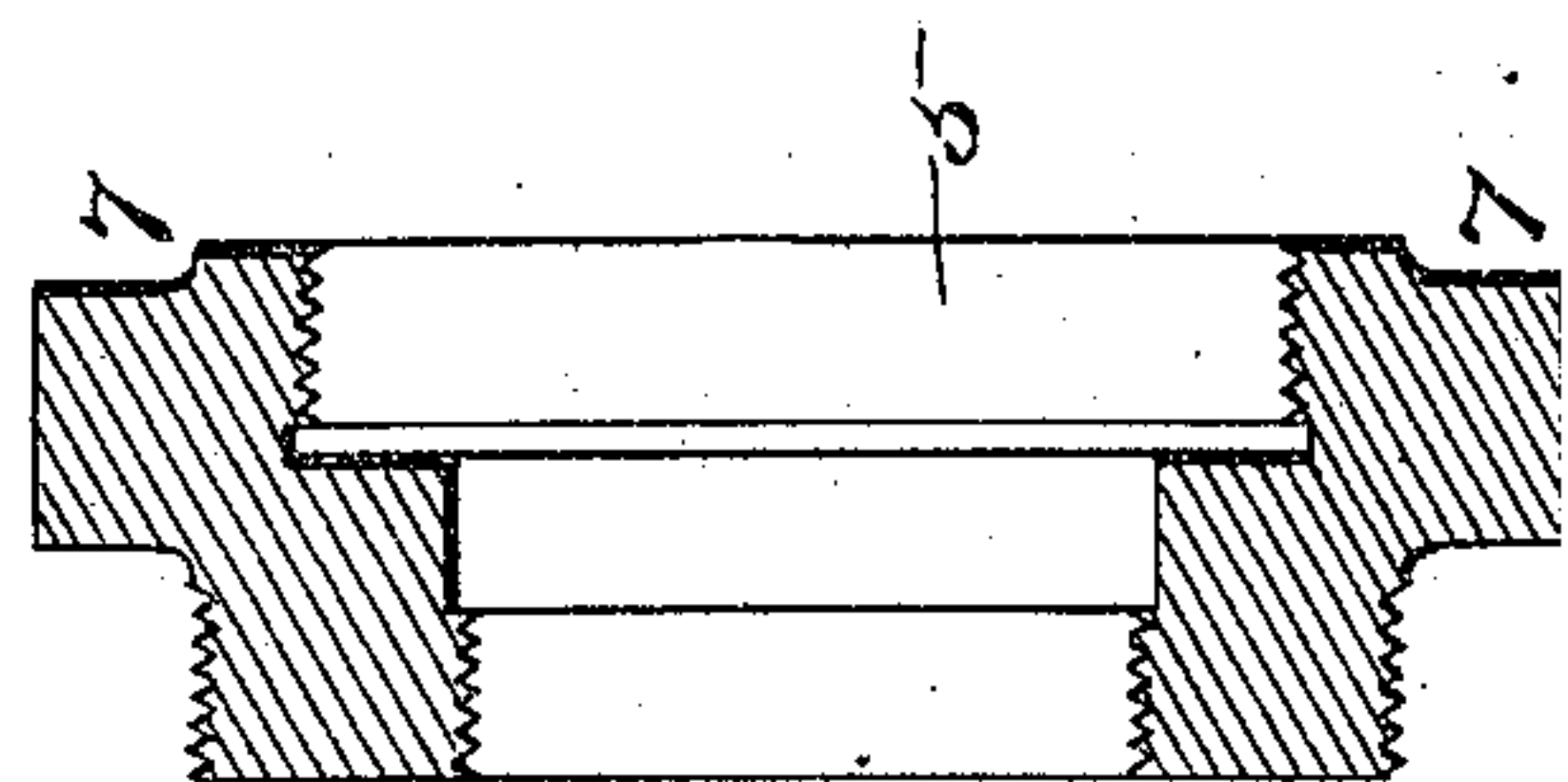
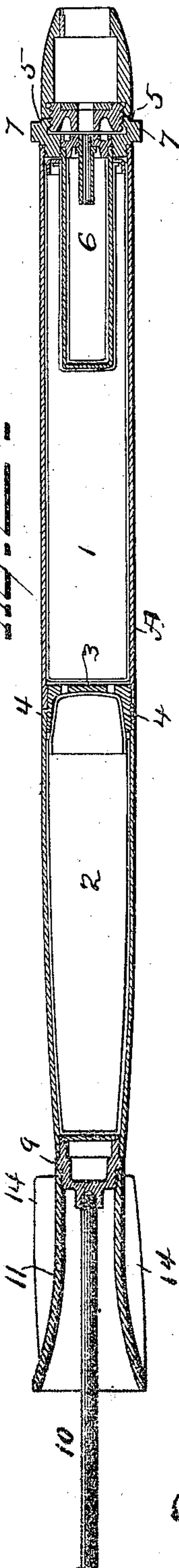
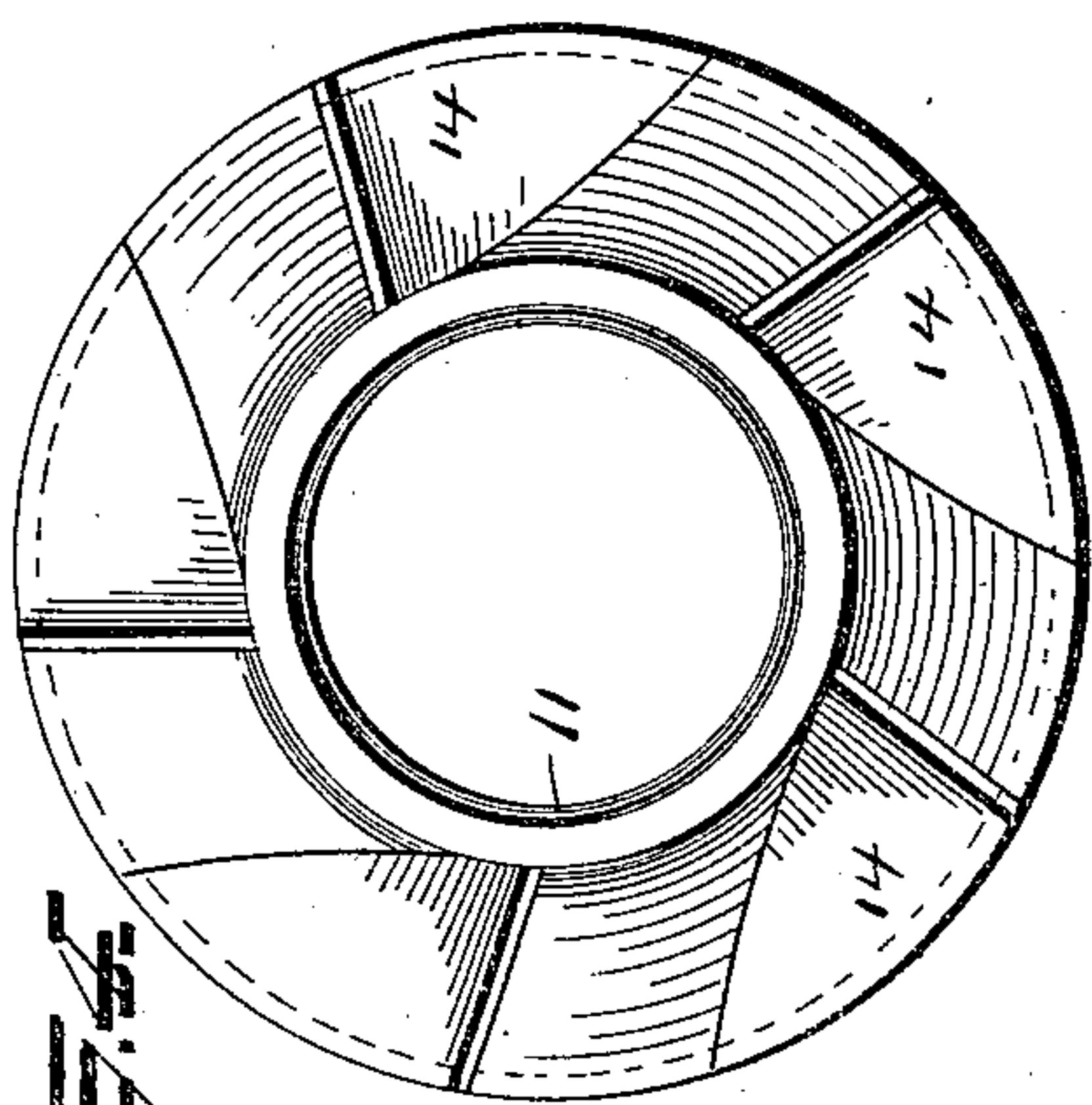
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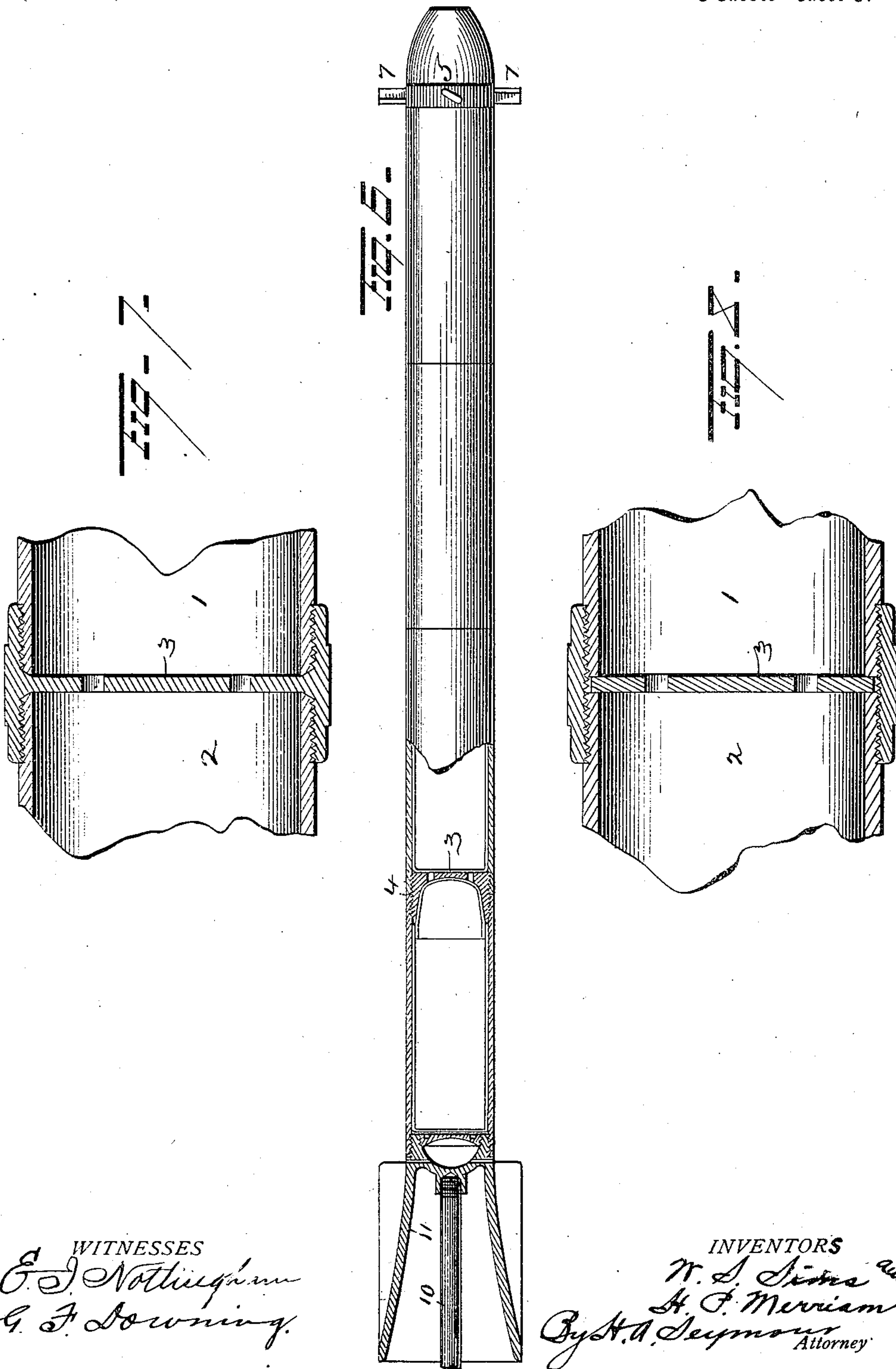
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UNITED STATES PATENT OFFICE.

WINFIELD SCOTT SIMS AND HENRY P. MERRIAM, OF NEW YORK, N. Y.

PROJECTILE.

SPECIFICATION forming part of Letters Patent No. 667,407, dated February 5, 1901.

Application filed March 17, 1900. Serial No. 9,112. (No model.)

To all whom it may concern:

Be it known that we, WINFIELD SCOTT SIMS and HENRY P. MERRIAM, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Projectiles; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to an improvement in projectiles designed more particularly for use with the high-explosive gun patented February 7, 1899, to Winfield S. Sims, No. 619,025; and it consists in the parts and combinations of parts, as will be more fully explained, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in section of a portion of the Sims gun, showing our improved projectile therein. Fig. 2 is a view in longitudinal section of the projectile. Fig. 3 is an enlarged view, in side elevation, of the tailpiece. Fig. 4 is an end view of same. Fig. 5 is an end elevation of the head, showing the centering-stud. Fig. 6 is a view in longitudinal section of a modified form, and Figs. 7 and 8 are views of modified constructions.

A represents a projectile made up of a series of sections detachably secured together. In Fig. 2 the body portion of the projectile is shown composed of two sections, whereas in Fig. 6 it is made up of four body-sections. These sections 1 and 2 are preferably made of steel tubing, the adjacent ends of the sections being threaded internally to engage the externally-threaded flange 4 of the metal diaphragm 3. While the explosion of a charge in one chamber would probably be communicated to the charge in the adjacent chamber through an imperforate diaphragm, still to render the detonation of the explosive in all the chambers absolutely certain and simultaneous the diaphragms connecting the several chambers are perforated, as clearly shown in Fig. 2. The chambers 1 and 2 are preferably lined with paper and filled with explosive gelatin, and it will be seen that by making the projectile in sections and interposing diaphragm between the sections the charge is subdivided and the intensity of the shock also subdivided, thus lessening the

possibility of premature explosion by the shock of discharge. To the front end of cylindrical section 1 is secured the head 5, made in sections, as shown, and carrying a fuse and dry gun cotton detonator 6, the latter extending rearwardly into the front end of the section 1 of the body of the projectile. The front end of this head is made to conform to the general contour of the head of the ordinary projectile, and the body thereof which is connected directly to the tube 1 is provided with a series of studs 7, which maintain the subcaliber projectile centrally within the smooth bore of the projectile-tube 8.

If there be more than two sections of the body of the projectile, we prefer to make all but the rear one 2 cylindrical, the latter being preferably tapering or conical, with its smaller end at the rear. This smaller end carries the tail-block 9, which may be brazed or otherwise secured to the section 2, and the tail-block 9 carries the tail-rod 10 and the hollow bell-shaped tailpiece. The rod 10 passes through and beyond the tailpiece 11 and bears against the breech-block 12, so as to insure position of projectile in advance of the port 13, while the bell-shaped tailpiece 11 is made to snugly fit the bore of the projectile-tube 8 and assists the lugs 7 in holding the projectile centrally within the bore and also acts as a gas-check. By constructing the tailpiece in the shape of a bell with thin walls the pressure of the gas behind and within same causes the outer rear end to expand and bear against the walls of the projectile-tube and form an effective gas-check, thus dispensing with the detachable sabot ordinarily used with this class of projectiles.

The tailpiece 11 is provided externally with rigid oblique wings 14, which latter are approximately as long as the tailpiece and are designed to rotate the projectile in its flight.

While we have described the sections as being internally threaded and secured to externally-threaded flanges of the diaphragm, it is apparent that the diaphragm may have female-threaded flanges to engage external threads of the sections, as shown in Fig. 7, or the diaphragm may be set between the adjacent ends of two sections and the parts secured by sleeves, as shown in Fig. 8.

In the construction shown in Fig. 6 the body

portion of the projectile is made up of four sections, the rear section being cylindrical and secured directly to the smaller end of the tail-piece 11.

- 5 The external shape of the projectile depends largely on the relative diameters of the bore and projectile. Where the size of the body of the projectile closely approaches that of the bore of projectile-tube, we secure the neces-
 10 sary area for the wings and base to secure steady flight by tapering the body of the projectile at the rear as it approaches the bell-shaped base. The taper is preferably made long, so as to present a shape which the air-
 15 currents can follow with as little disturbance as possible, whereby the bell-shaped base, with its wings, is made effective for securing steadiness in flight.

It is evident that changes in the construc-
 20 tion and relative arrangement of the several parts might be made without avoiding our invention, and hence we would have it understood that we do not restrict ourselves to the particular construction and arrangement of
 25 parts shown and described; but,

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

1. A projectile for high explosives comprising
 30 ing a body the rear portion of which is made tapering or conical and a bell-shaped hollow tailpiece forming a permanent part of the projectile and attached to the smaller end of said conical portion, the said bell-shaped tailpiece
 35 having a series of external oblique wings, and adapted to closely fit the bore of the gun and act as a gas-check.

2. A projectile for high explosives comprising
 40 ing a body the rear portion of which is made tapering or conical, and a bell-shaped tailpiece forming a permanent part of the projectile and having a series of external oblique wings, the rear end of said bell-shaped tailpiece being of greater diameter than the body
 45 of the projectile and adapted to secure steady flight of the projectile both by reason of the drag and by the rotation caused by the wings.

3. A projectile for high explosives compris-

ing a head, an enlarged flaring hollow tail-piece forming a permanent part of the project- 50
 ile and provided with external oblique wings, a sectional body, and diaphragms located at the junctures of the body-sections.

4. A projectile for high explosives comprising a head, an enlarged flaring hollow tail- 55
 piece forming a permanent part of the projectile, and having external oblique wings, a sectional body and diaphragms having flanges for connecting the sections of the body, substantially as set forth. 60

5. A projectile for high explosives comprising a body and an enlarged flaring hollow tailpiece, the latter forming a permanent part 65
 of the projectile and having external oblique wings.

6. A projectile for high explosives comprising a body, a head having centering-lugs, and a bell-shaped tailpiece the latter forming a permanent part of the projectile and having a series of external oblique wings. 70

7. A projectile for high explosives comprising a body, a head having centering-lugs, and a bell-shaped tailpiece the latter forming a permanent part of the projectile and carrying a tail-rod and provided externally with a se- 75
 ries of oblique wings.

8. A projectile for high explosives comprising a body made up of sections detachably secured together at their adjacent ends, a head secured to the front section of the body and 80
 provided with a series of centering-lugs, and a bell-shaped tailpiece secured to the rear section and forming a permanent part of the projectile, the bell-shaped tailpiece being of greater diameter than the body of the project- 85
 ile and provided with a series of external wings.

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

WINFIELD SCOTT SIMS.
 HENRY P. MERRIAM.

Witnesses.

FRANK H. GARVIN,
 H. F. FOEVERT.