

W. H. McNUTT.  
NON-EXPLOSIVE CLOSURE FOR TANKS.  
APPLICATION FILED NOV. 19, 1906.

900,763.

Patented Oct. 13, 1908.

FIG. 1.

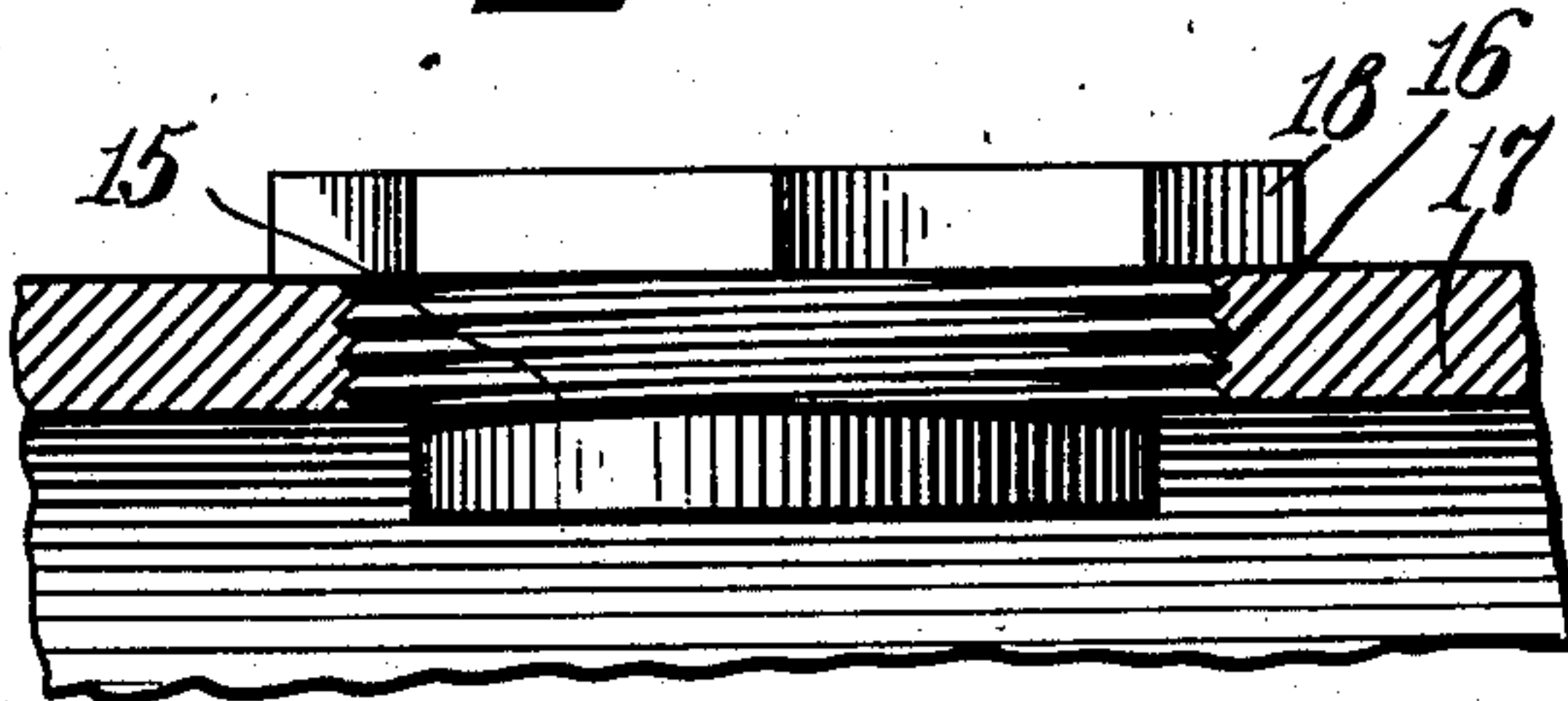


FIG. 3.

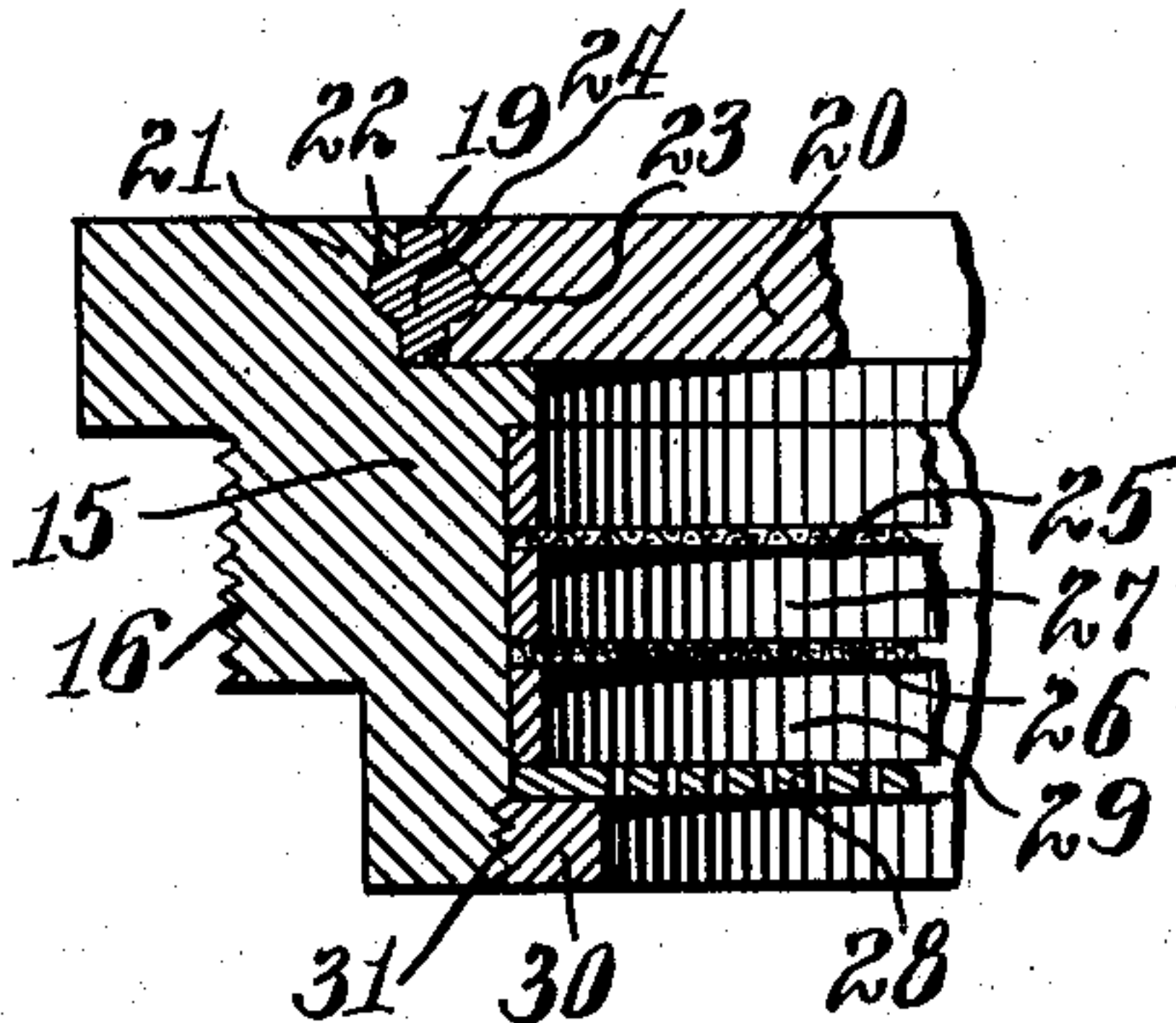


FIG. 2.

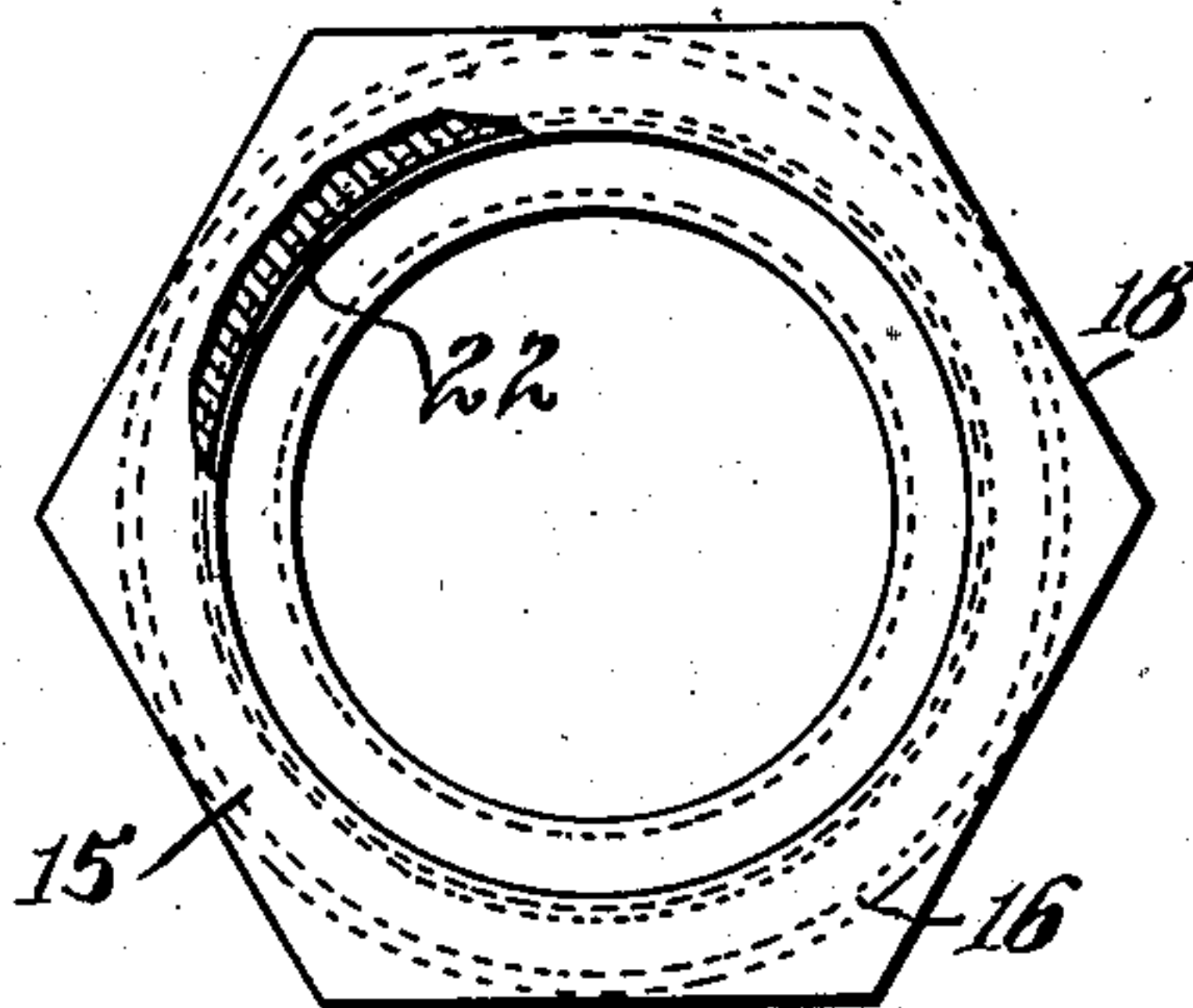


FIG. 4.

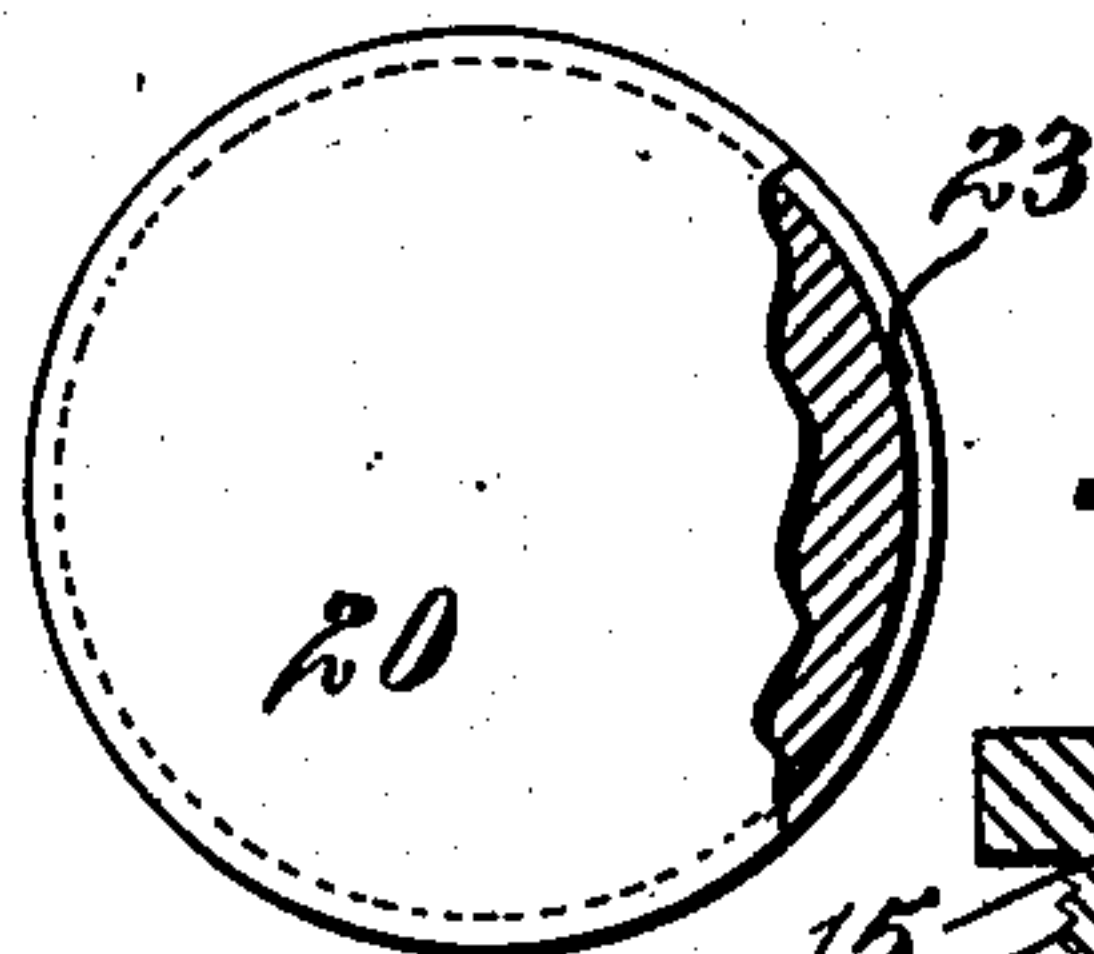


FIG. 8.

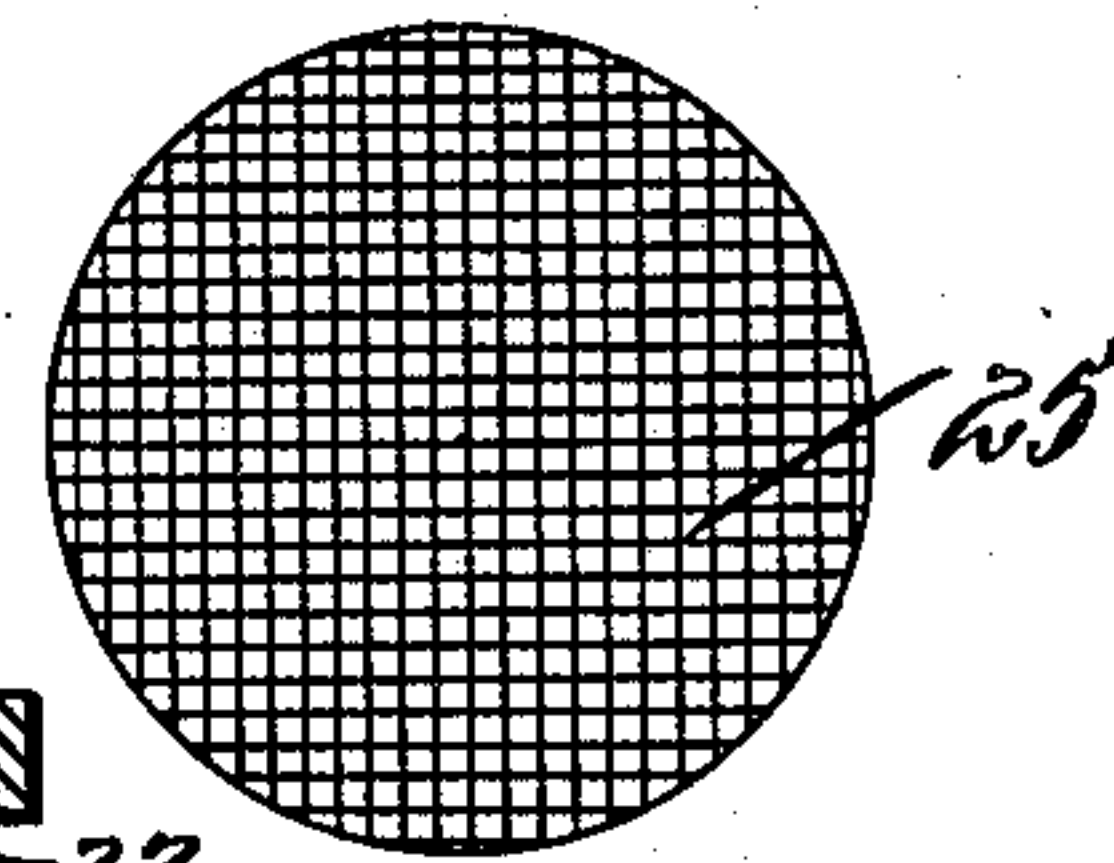
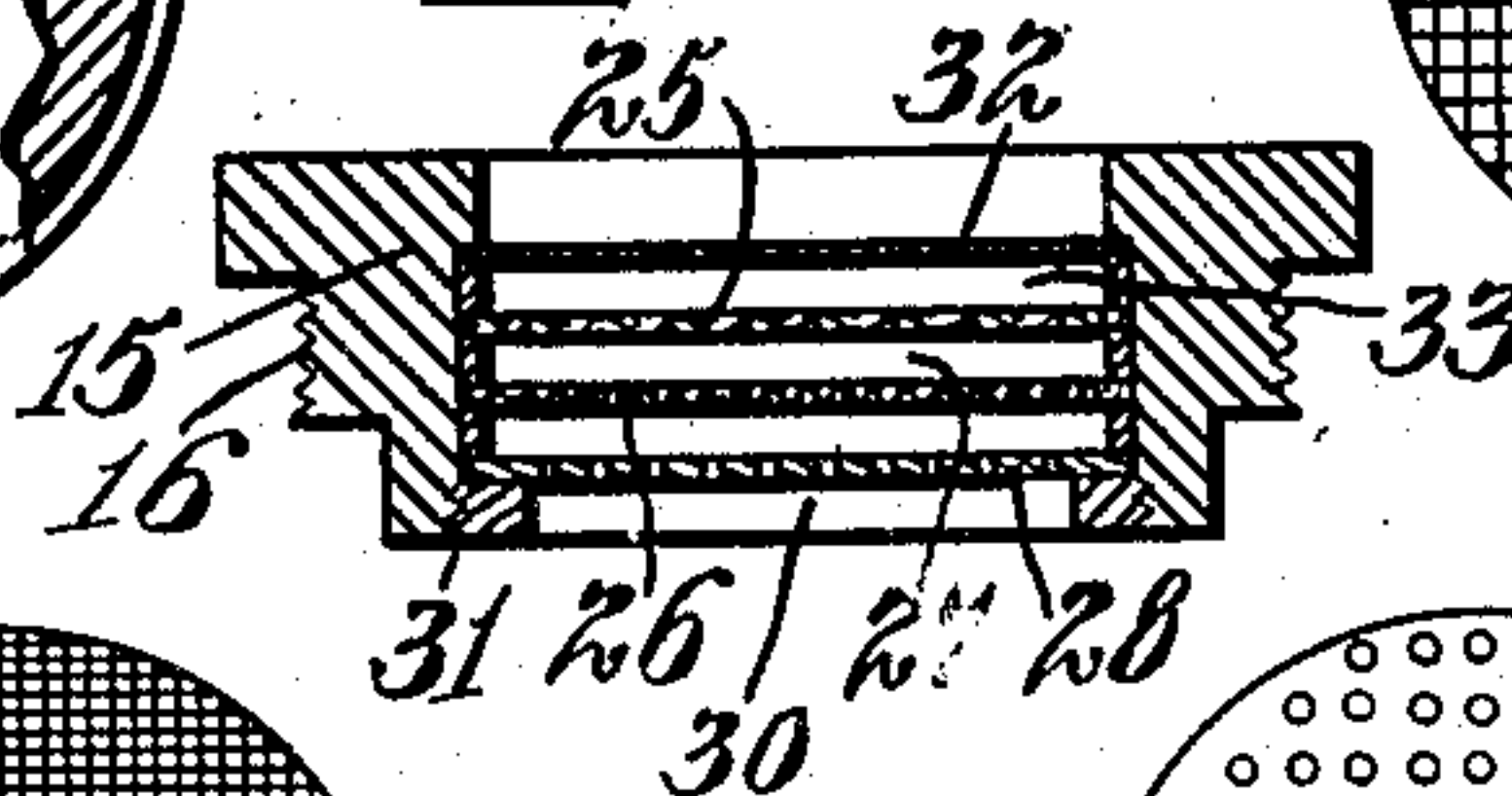


FIG. 6.

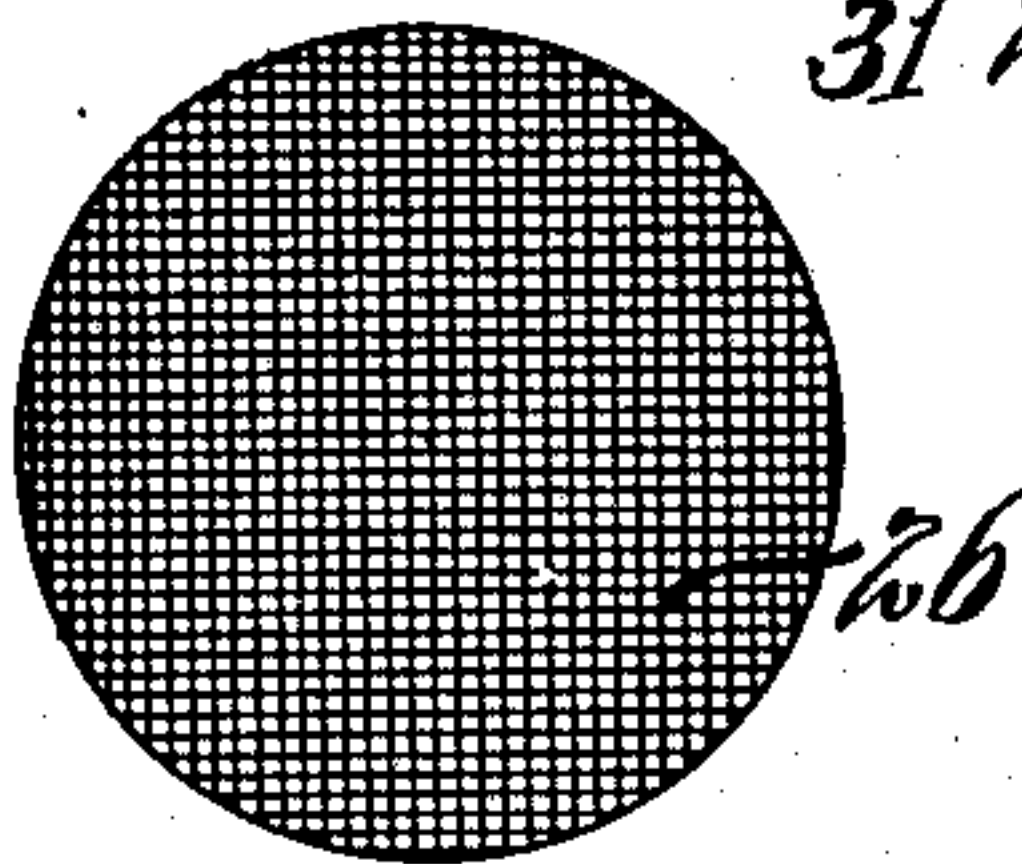
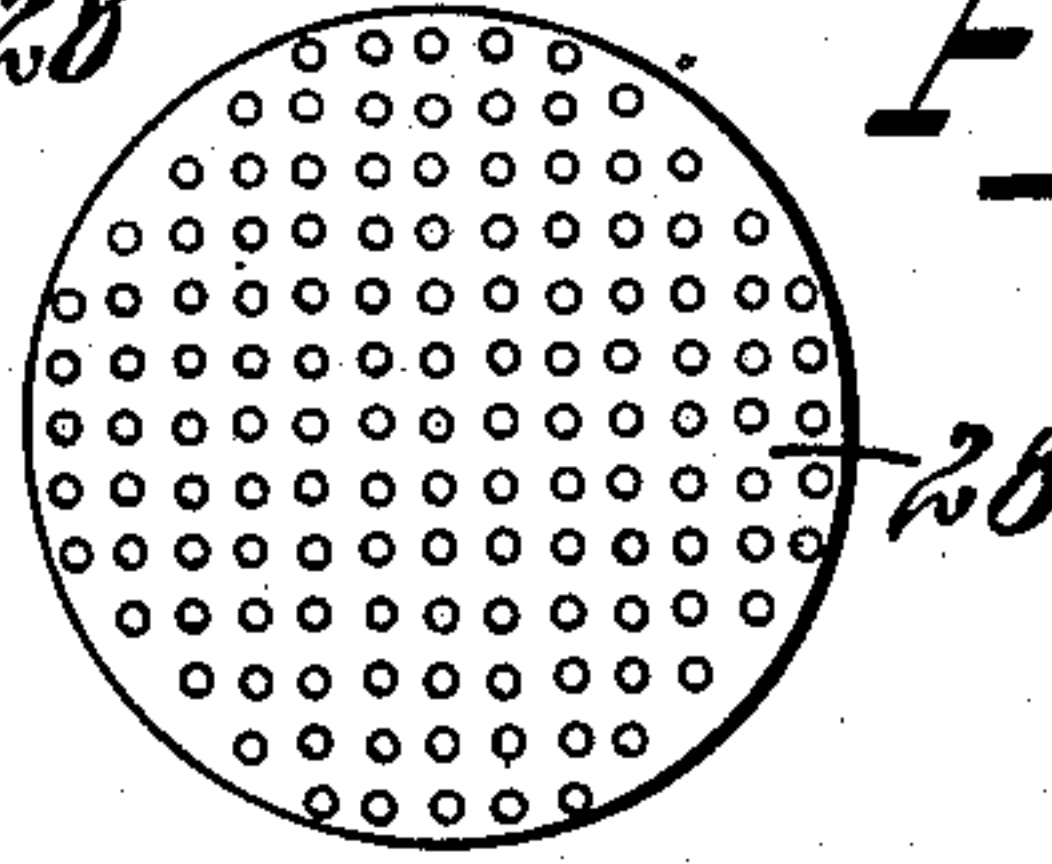


FIG. 7.



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## NON-EXPLOSIVE CLOSURE FOR TANKS.

No. 900,763.

Specification of Letters Patent.

Patented Oct. 13, 1908.

Application filed November 19, 1906. Serial No. 343,991.

*To all whom it may concern:*

Be it known that I, WILLIAM H. McNUTT, a citizen of the United States, residing in New York city, in the county of New York and State of New York, have invented certain new and useful improvements in Non-Explosive Closures for Tanks, of which the following is a specification.

This invention relates to tanks or vessels for containing explosive fluids, such as naphtha or gasoline, and has for its object to provide an improved safety device whereby upon abnormal heat being generated in the vicinity of the vessel or tank, the vapor generated from the fluid will be permitted to escape and to burn without the flame firing back into the tank to cause an explosion.

In the accompanying drawings is illustrated embodiments of the invention, in which

Figure 1 is a side elevation of the tank cap. Fig. 2 is a plan view of the cap. Fig. 3 is a partial cross section. Fig. 4 is a plan view of the safety disk. Figs. 5, 6 and 7 show the several apertured members permitting escape of the gas without back fire of the flame; and Fig. 8 is a vertical section showing a modified form of cap and indicator.

The cap is secured to the tank in any desired manner. It is shown as comprising a sleeve 15 having an external threaded portion 16 by which it may be screwed into the tank 17. The cap may be provided with a polygonal rim portion 18 for engagement by a wrench.

At the upper portion the cap has an annular rabbet portion 19 in which is fitted safety cap 20, shown separately in Fig. 4. The diameter of the cap is somewhat smaller than the rabbet portion leaving a space between the opposite curved walls. And these latter walls are shown as provided with annular channels. The wall 21 of the rabbet portion being shown as having a channel 22; while the periphery of the disk 20 is shown as having a channel 23, that is located opposite the channel 22, as shown in Fig. 3. Any suitable fusible binding material is placed in the space between the periphery of the disk 20 and the opposite wall 21, such as a fusible cement 24 as shown. This cement will flow or is forced into the two channels and serves as locking means to prevent removal of the disk or cover 20 by ordinary pressure. But

upon the tank being subjected to heat, this fusible ring 24 will melt or become plastic and lose its rigidity, thereby permitting the pressure in the tank, that will be elevated by the gases generated from the heat, to blow off the cap 20. The gases issuing from the tank would be at once ignited, and if the burning gases should reach the surface of the fluid in the tank, an explosion would occur. In order to prevent the gas from igniting at the surface of the liquid, one or more finely apertured partitions are located below the position of the cover 20. In the construction illustrated there are shown three apertured plates. A disk 25 of coarse wire gauze is placed a short distance removed from the cover 20; thereupon a second disk of wire gauze 26 of somewhat finer mesh, is placed below the disk 25, and may be separated therefrom by a ring 27. Finally a disk 28 of perforated sheet metal is placed below the disk 26, and spaced therefrom by a ring 29. All of these members may be locked in place by a threaded locking rim 30, screwing into the internal threaded portion 31 of the sleeve 15. By this construction, when the heat shall have melted the fusible locking ring 24, and the plate 20 shall have been blown off, the gas will issue through the several perforated or foraminous disks, and thereupon will be ignited by the heat. But these disks will effectually prevent the gas igniting below them, on the principle of the Davy safety lamp, wherein fire-damp in mines will burn on the outside of a gauze chimney, but will be prevented from igniting inside and causing an explosion.

This invention is of great utility in connection with the use of gasoline or naphtha for explosive engines, or for generating steam for engines, carried by motor vehicles or launches. Upon a fire starting in either of such places, the fusible ring will permit the cap to blow out, and gas will burn outside of the perforated plates, without reaching the gasoline or naphtha; and thereby prevent an explosion. Upon the fire being extinguished, the burning gas can be readily extinguished by cutting off the air and covering it as with a cloth or the like; and it will not be necessary to draw off the gasoline or naphtha from the lower part of the tank, thereby tending to cause an explosion. The cap 20 can be readily replaced after being blown out, by the use of a new fusible ring.



Any desired or suitable form of a fusible closing device can be used in connection with the apertured plate or plates that will yield or blow out upon the application of heat, 5 permitting escape of the vapors from the contents of the tank. In Fig. 8 is shown a modification in which a glass plate 32 is used instead of the disk 20. The plate 32 being located above the wire plate 25, and separated therefrom by a ring 33. Upon undue 10 pressure being generated by heat reaching the tank, this glass plate will be readily broken, permitting escape of the gases. And the heat will ignite the gases outside of the 15 apertured plate or plates, that will prevent the flame passing back into the tank.

By the construction of the three diaphragms as shown in Fig. 3, the intermediate diaphragm 26 of fine mesh acts as a 20 safety plate to prevent passage of flame therethrough and to make it impossible for the vapor below this diaphragm to ignite. The comparatively thick perforated diaphragm 28 below the diaphragm 26 acts as 25 a safe-guard, and prevents the diaphragm 26 from being deflected to any extent or punctured. The diaphragm 25 of coarse mesh acts as an additional safe-guard to prevent the insertion of any device from engaging the 30 disk 26; and also acts to prevent internal pressure from displacing the disk 26 to any considerable extent. The disk 26 is thereby protected on both sides from injury by a foreign body, or from extreme pressure.

35 Having thus described my invention, I claim:

1. A closure for tanks comprising a bushing provided with an annular shouldered portion at its outer part, a closure disk located in said shouldered portion and of less 40 diameter than the shouldered portion, the disk being provided with an annular channel in its periphery, the opposite wall of the shouldered portion being also provided with an annular channel, a fusible ring arranged 45 between the periphery of the disk and the channel portion whereby the disk is normally locked in position, the bushing having its aperture threaded at one portion, a plurality of apertured diaphragms extending 50 across the aperture, ring members separating the diaphragms at their margins, and a ring nut threaded in the aperture of said bushing clamping the diaphragm and ring 55 members in position.

2. A closure for tanks comprising a bushing, fusible means arranged to close the aperture in the bushing at normal temperature, said bushing being internally threaded at its 60 opposite end, a series of apertured diaphragms located in the bushing, ring members inserted between the diaphragms at their margins to separate the diaphragms, and a ring nut member screwed into the 65 threaded aperture to clamp the diaphragm and ring members in position.

Signed at Numbers 9-15 Murray street, New York, N. Y., this 2nd day of July, 1906.

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Witnesses:

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