

No. 848,206.

PATENTED MAR. 26, 1907.

B. W. ROBINSON.
SAFETY PLUG.

APPLICATION FILED JAN. 7, 1907.

Fig. 1.

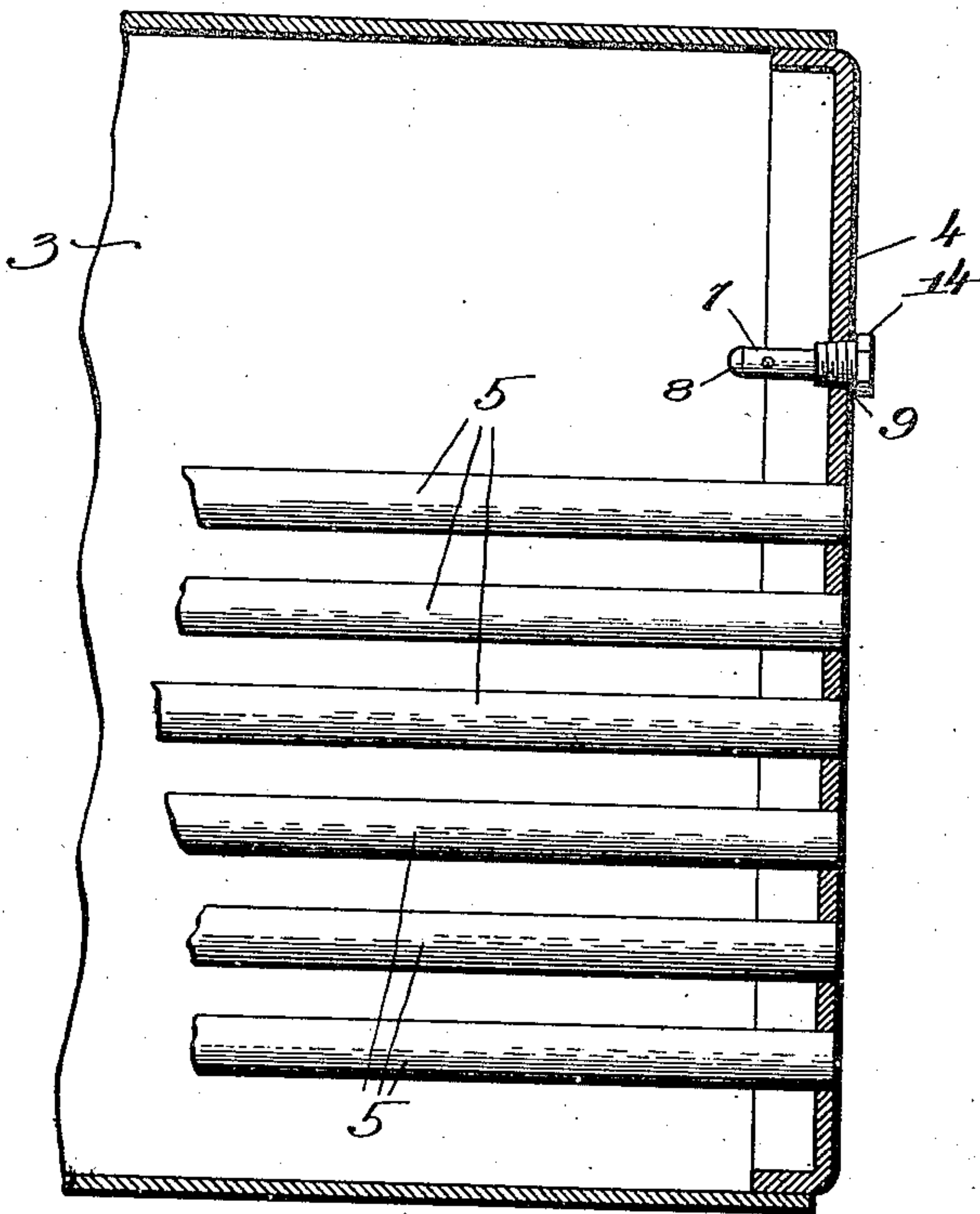


Fig. 2.

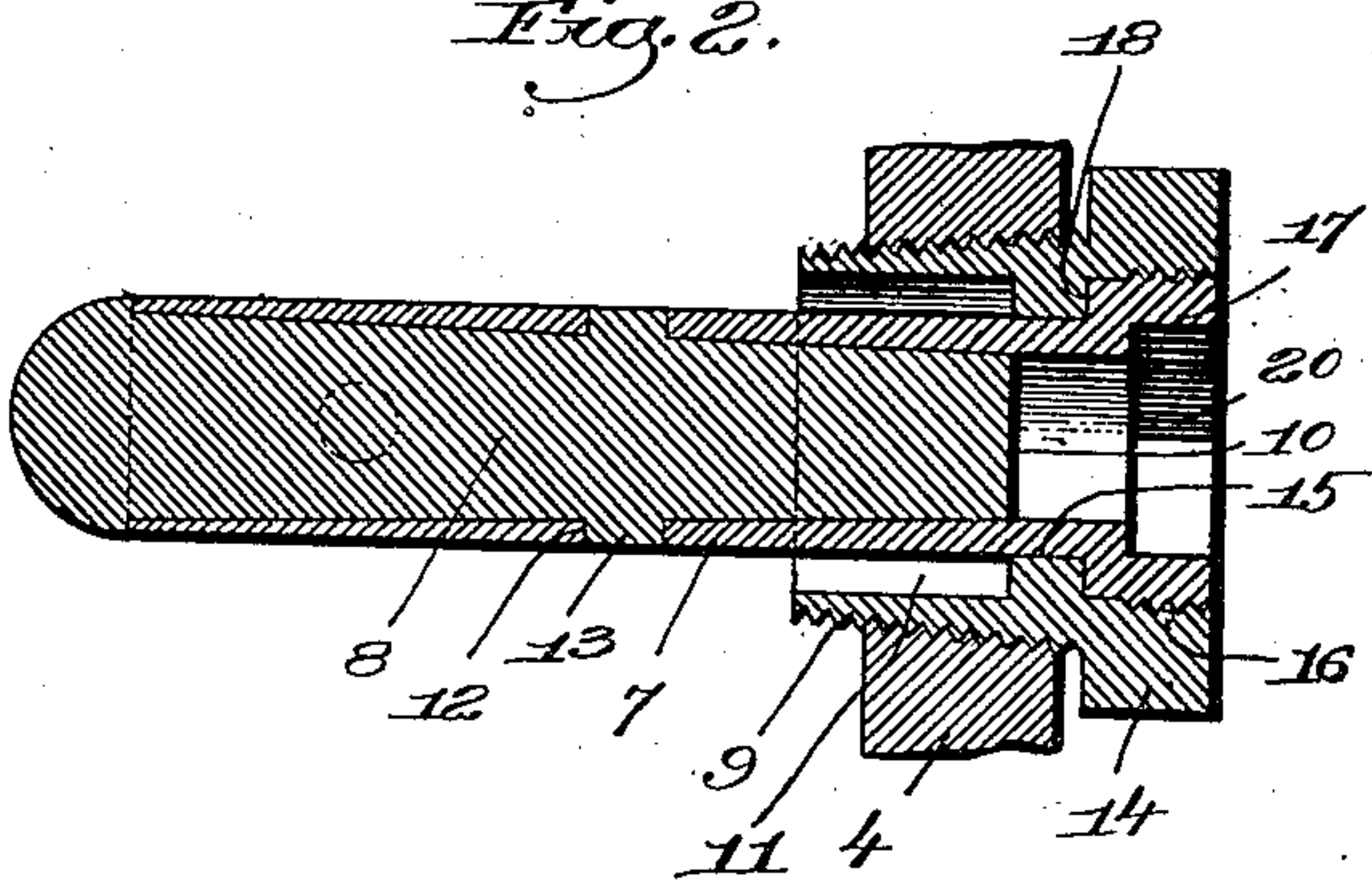
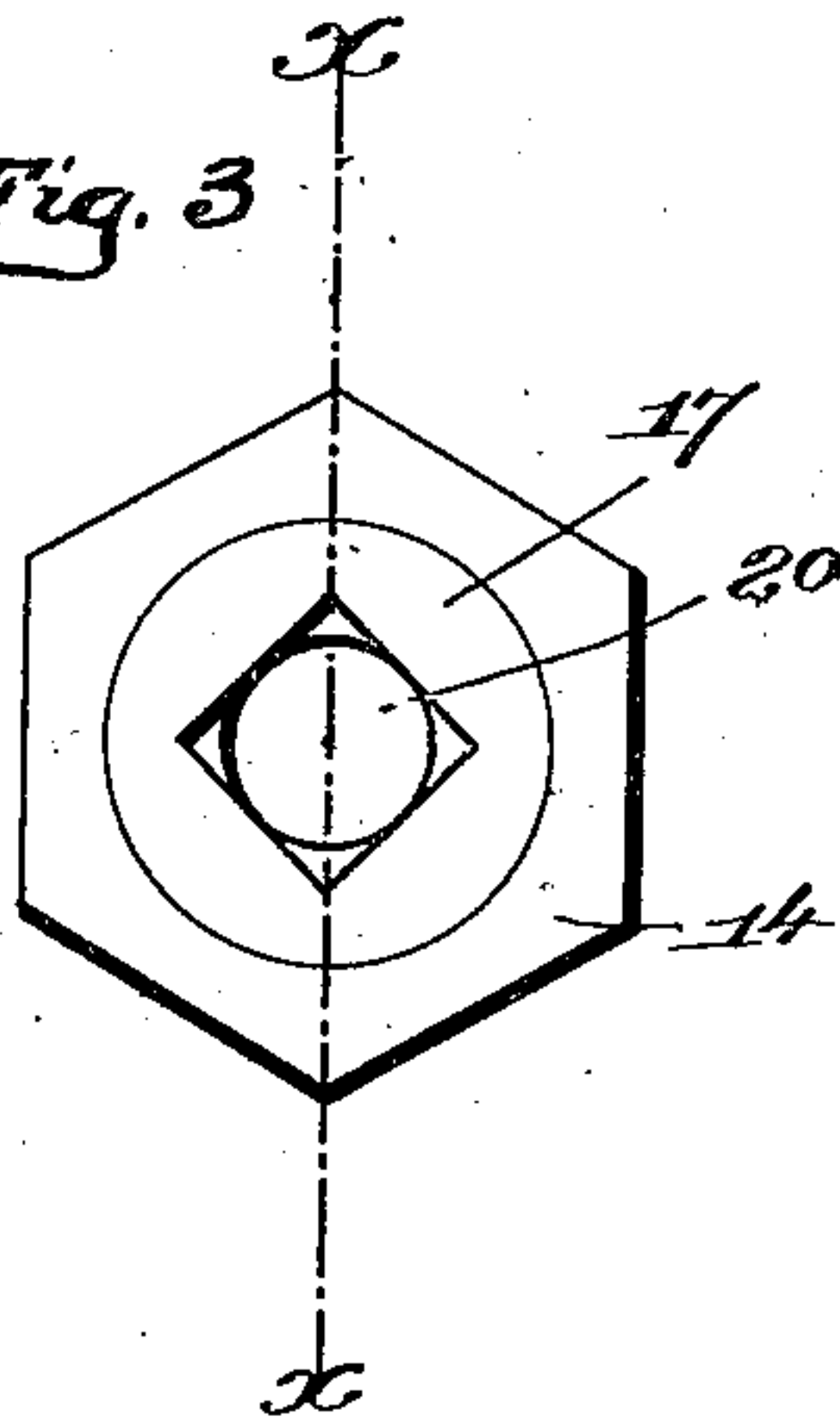


Fig. 3.



Witnesses:

Fried. S. Grunlof.
Joseph M. Ward

Inventor.

Bliss W. Robinson,
by Lewis J. Gregory,
attys.

UNITED STATES PATENT OFFICE.

BLISS W. ROBINSON, OF BOSTON, MASSACHUSETTS.

SAFETY-PLUG.

No. 848,206.

Specification of Letters Patent.

Patented March 26, 1907.

Application filed January 7, 1907. Serial No. 351,084.

To all whom it may concern:

Be it known that I, BLISS W. ROBINSON, a citizen of the United States, residing in Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Safety-Plugs, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

10 This invention relates to safety-plugs, such as are used in steam-boilers for giving indication when the water-level in the boiler gets below a predetermined point. These safety-plugs as commonly made are in the form of a
15 bushing which is screwed into the flue-sheet, fire-sheet, or some other suitable portion of the boiler at the desired point, said plugs being filled with some fusible metal. Usually the inner ends of these plugs extend into the
20 water-space of the boiler, so that they are surrounded by water, and so long as the water-level is above the plugs the water keeps the fusible metal therein sufficiently cool so that it will not melt. These plugs, however, often
25 become so rusted into the fire-sheet that it is almost impossible to remove them when they become damaged without injuring the fire-sheet or breaking the shell of the plug; and it is one of the objects of my present invention
30 to provide a novel form of plug in which the shell or casing inclosing the fusible metal is made in a separate piece from the bushing that screws into the fire-sheet, so that to renew the plug it is not necessary to remove
35 the bushing, but simply to remove the shell or holder from the bushing and insert a new shell or holder.

In safety-plugs as commonly employed, too, the fusible metal extends into that portion of
40 the plug which is screwed into the fire-sheet, and as a result the water surrounds only a portion of the fusible metal. With this type of plug it often happens that the severe heat to which the fire-sheet is subjected softens the
45 fusible metal sufficiently so that it will begin to flow even though the inner end of the plug is surrounded by water, in which case the plug might blow before the water-level reached the danger-point. To avoid this objection, I
50 have in the present embodiment of my invention so designed my plug that the water surrounds the entire portion of the shell or holder in which the fusible metal is situated, so that the heat cannot be conducted to the
55 fusible metal through the fire-sheet in suffi-

cient quantities to melt said metal so long as the water is above the level of the plug.

Another feature of my invention relates to a novel way of anchoring the fusible metal in the shell.

A construction embodying my invention will now be described, and the invention will then be pointed out in the appended claims.

Referring to the drawings, Figure 1 shows one end of a boiler, showing my improved
60 safety-plug. Fig. 2 is a longitudinal section through the safety-plug on the line *x x*, Fig. 3. Fig. 3 is an end view.

I have shown in Fig. 1 at 3 a tubular boiler of any usual construction, 4 being the
70 fire-sheet into which the flues or fire-tubes 5 are secured as usual.

My improved safety-plug is screwed into the fire-sheet 4 at the desired point, which is below the normal water-level and below the
75 danger-point. The safety-plug is formed with a screw-threaded portion 9, which is screw-threaded into the fire-sheet 4, and is also provided with a shell or holder 7, in which the fusible metal 8 is located. The
80 shell or holder 7 is tubular in shape, and the fusible metal 8 extends forwardly therein to a point 10 nearly to the front end thereof. In order to prevent the fusible metal from being
85 softened sufficiently so that it will flow by conduction of heat thereto through the fire-sheet while the inner end of the plug is still covered with water, I form in the plug
90 an annular chamber 11, which surrounds the shell 7 and extends as far toward the front of the plug as the fusible metal does, so that when the plug is in place there will be a body
95 of water surrounding the portion of the shell 7 that is filled by the fusible metal 8. So long as the plug is covered with water the entire body of fusible metal will be kept sufficiently
100 cool so that it will not flow and the plug will remain intact until the water-level in the boiler drops below the plug. I have also in this embodiment of my invention shown the
105 fusible metal 8 as anchored in the shell by providing said shell with apertures 12, which become filled with anchor portions 13 of fusible material when the plug is filled. These
110 anchor portions serve to more securely hold the fusible material in the shell and also assist materially in keeping the fusible metal 8 at the same temperature as the water in the boiler.

In order to facilitate the renewal of the

plug when it becomes damaged, I prefer to make the shell 7 independent and separate from the screw-threaded bushing member 9, so that the shell may be removed from the bushing without removing the bushing from the fire-sheet. As herein shown, the member 9 has a head 14, provided with a bore 15 of smaller diameter than the annular chamber 11, said bore being enlarged at its outer end and provided with interior screw-threads 16. The shell 7 has the head 17, provided with the exterior screw-threads which screw into the interior screw-threads 16, said shell having a shoulder 18 to rest against a corresponding shoulder formed in the head 14 of the bushing. The shell 7 is preferably suitably formed at its outer end so that a wrench may be applied thereto for unscrewing it from the bushing 9, and in the preferred embodiment of my invention this is accomplished by providing the end with the square wrench-socket 20. In practice the bushing 9 becomes so rusted into the fire-sheet that it is almost impossible to remove it; but by placing fusible metal 8 in the shell 7, which is separate from the bushing and removably supported thereby, the portion of the plug containing the fusible metal may be readily removed after the plug blows and a new portion inserted without disturbing the bushing in the fire-sheet.

I desire to call attention to the fact that the seat or shoulder 18 is located between the screw-threads on the head 17 and the portion of the shell 7 that projects into the water. In inserting a plug this seat 18 will be so made that a water-tight joint will be formed, and thus the water is prevented from working its way into the screw-threads 16. With this construction, therefore, the screw-threaded head 17 of the shell will never become so rusted to the bushing 14 as to prevent the shell from being removed. This placing of the seat between the screw-threaded portion of the shell and the portion projecting into the water is one of the important features of the invention in a construction wherein the shell is made removable from the bushing. It is not essential to my invention, however, that the shell portion 7 should be made separate from the bushing portion 9, as the two might be made integral, although I prefer to make them separate, for reasons above stated.

I believe I am the first to invent a safety-plug which is formed with an annular water-chamber, such as 11, that extends into the plug as far toward the front thereof as the fusible material, so that when in place the fusible material is surrounded on all sides with a body of water, and I desire to claim this feature broadly, whether the plug be formed in two parts or in one. I also believe that I am the first to provide a plug having a bushing to screw into the fire-sheet

and a separate detachable shell or holder for holding the fusible material. I also believe that I am the first to provide a safety-plug which is made in two parts with the seat, such as 18, situated between the screw-threaded head of the shell and the portion which projects into the water.

It will be understood, of course, that the shell 7 may be made of any length desired, according to the location in which the plug is put.

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

1. A safety-plug for boilers provided with a chamber containing fusible material and another chamber constituting a water-space surrounding the first-named chamber.

2. A safety-plug provided with an exterior screw-threaded portion for screwing into a flue-sheet of a boiler, and a shell portion extending therethrough and containing fusible material, said screw-threaded portion and shell portion being spaced from each other.

3. A safety-plug having an annular screw-threaded bushing portion and a shell portion concentric therewith and extending therethrough but spaced therefrom, and fusible material within the shell portion.

4. A safety-plug comprising a bushing adapted to be screw-threaded into a flue-sheet, and a shell portion containing fusible material removably carried by the bushing portion and removable from the outer end thereof.

5. A safety-plug comprising a bushing adapted to be screw-threaded into a flue-sheet, and a shell portion containing fusible material screw-threaded to the bushing portion and removable from the outer end thereof.

6. A safety-plug comprising a bushing adapted to be screw-threaded to a flue-sheet, a shell portion screw-threaded to the bushing and containing fusible material, said shell portion and bushing being spaced from each other at the inner end of the bushing to form an annular water-chamber.

7. A safety-plug comprising a shell portion provided with perforations in its sides and fusible material contained within the shell portion and exposed through said perforations.

8. A safety-plug comprising a shell, fusible material within the shell, and means to anchor said fusible material to the shell by the material itself.

9. A safety-plug comprising a bushing portion provided with interior screw-threads and a seat, and a shell portion extending through the bushing portion and having a shoulder to engage said seat, and exterior screw-threads to engage the interior screw-threads of the bushing, said seat being situated between the screw-threaded portion of

the shell and the portion projecting into the water.

10. A safety-plug comprising a bushing portion having interior screw-threads at its
5 outer end, and a shell portion to contain fusible metal extending through the bushing portion and provided with an exteriorly-screw-threaded end to engage the interior screw-threads of the bushing, and means to
10 make a water-tight joint between the bush-

ing and shell at a point between the screw-threaded portion of the shell and the inner end thereof.

In testimony whereof I have signed my name to this specification in the presence of 15 two subscribing witnesses.

BLISS W. ROBINSON.

Witnesses:

LOUIS C. SMITH,

BERTHA F. HEUSER.