

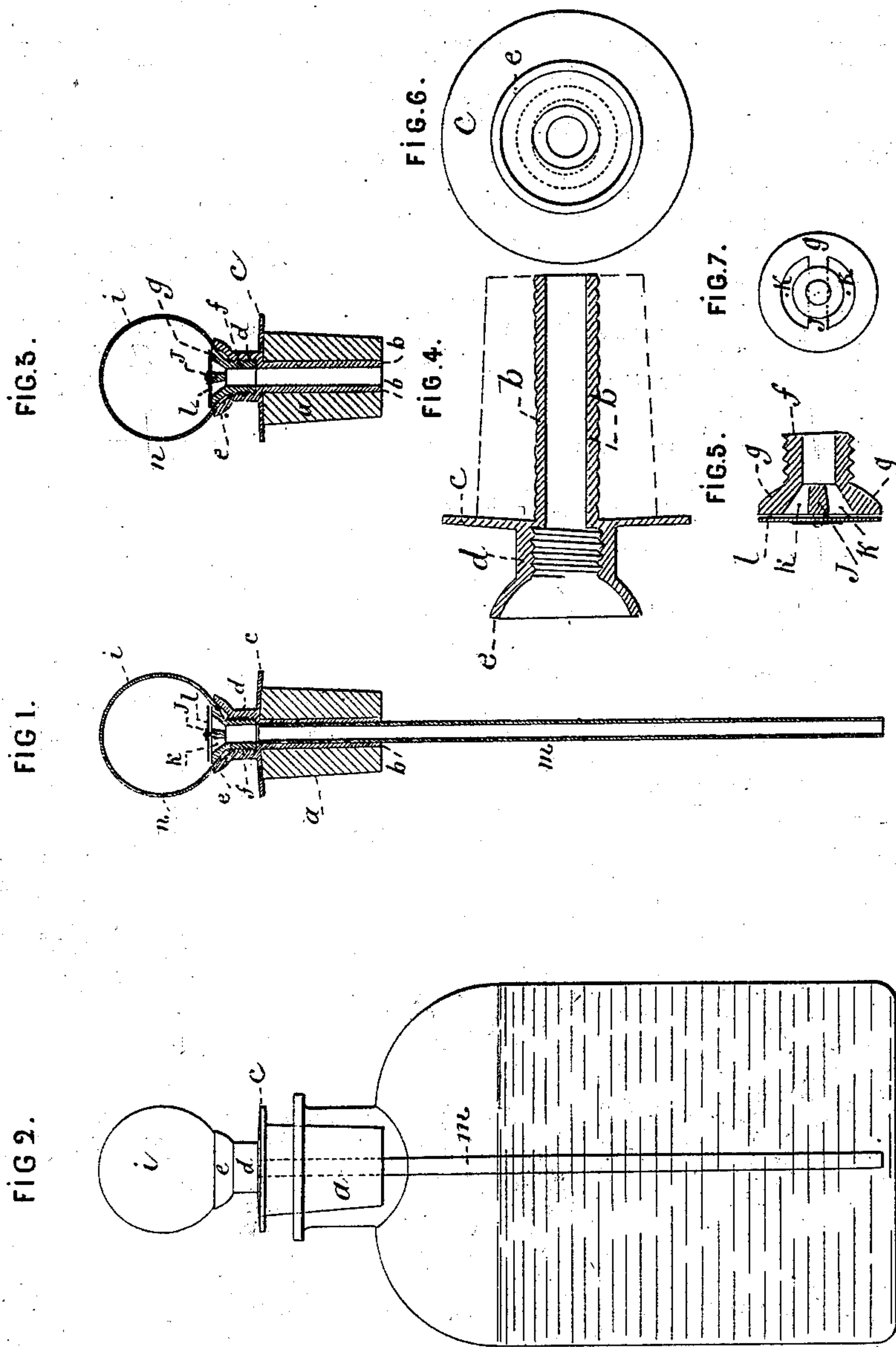
(No Model.)

G. PINAUD & P. GUICHARD.

PROJECTOR STOPPER.

No. 305,221.

Patented Sept. 16, 1884.



Witnesses:
C. Sedgwick
A. H. Davis

Inventor:
G. Pinaud
P. Guichard
By *Mumford*
Attorneys.

UNITED STATES PATENT OFFICE.

GEORGES PINAUD AND PIERRE GUICHARD, OF PARIS, FRANCE.

PROJECTOR-STOPPER.

SPECIFICATION forming part of Letters Patent No. 305,221, dated September 16, 1884.

Application filed July 26, 1884. (No model.)

To all whom it may concern:

Be it known that we, GEORGES PINAUD and PIERRE GUICHARD, of the city of Paris, France, have invented a new and Improved System of
5 Stopper for Bottles and Flasks, called "Projector-Stopper," of which the following is a full, clear, and exact description.

The invention for which we hereby apply for a patent is relative to a system of stop-
10 per or cork capable of being adapted to all kinds of bottles and flasks. By this system is obtained the projection of the liquid contained in the flask provided with our "projector-stop-
• per." The projection is produced by pressure
15 applied to a hollow india-rubber ball fixed to the top of the stopper, and by the return of the said ball to its original form and volume. The liquid may be projected in one or more
20 jets, according to the number of holes pierced in the ball. The holes are of course capillary, so as to allow of the passage of very thin jets only.

In order that our system of projector-stop-
per may be thoroughly understood, we will
25 now proceed to describe it in detail, and will in course of the description refer to the accompanying drawings.

In these drawings, Figure 1 represents a longitudinal section of the axis of the stopper.
30 Fig. 2 shows in elevation the application of our system to a flask. Fig. 3 is a longitudinal section of one of our stoppers. Unlike Figs. 1 and 2, this stopper is not provided with a tube plunged in the liquid. Figs. 4 and 5
35 6 and 7 show (on an enlarged scale) in plan and longitudinal section the details of the stopper without the tube which plunges in the liquid, and also without the ball which produces the aspiration and the projection of
40 the liquid.

As may be seen by reference to Figs. 1, 3, 4, 5, 6, and 7, our apparatus is composed of a cork, *a*, pierced through its center longi-
45 tudinally, so as to form a cylindrical or conical hole. In this hole is inserted a tube, *b*, surmounted by a flange which rests against the top of the cork, and which forms part of or is soldered to a larger tube, *d*, communi-
50 cating with the tube *b*, of which it is the prolongation. The tube *d* is widened at its upper end, so as to form a spherical cap, *e*. Another tube, *f*, is screwed into the tube *d*.

The tube *f* is terminated by a widened part, *g*, similar in form to the spherical cap *e*, into which it fits. The hollow ball *i* is held be- 55
tween the two parts *e* and *g*. The said ball is provided at its lower part with a circular opening, into which the tube *f* is introduced in such a manner that the edges of the open-
ing in the hollow ball come into contact with 60
the external surface of the cap *g*. It follows that when the tube *f* is screwed home in the tube *d* the ball is pressed and held tightly between the spherical parts *e* and *g*. The
65 spherical cap *g* is provided with a small metallic arm, *j*, at either side of which are openings *k*, which communicate directly at their lower extremities with the tube *f*. These openings
70 are covered on the top by a small india-rubber washer, *l*, attached by its center to the arm *j*, and capable of being raised at its circumference, so as to give admission to the liquid into the hollow ball *i*.

In Figs. 1 and 2 it is seen that a tube, *m*,
75 is fitted into the tube *b*, and forms the prolongation of the latter, and plunges into the flask to which is adapted our projector-stopper. Now, the hollow ball *i* being provided with a small hole, *n*, it suffices to press the ball slightly
80 and then allow it to reassume its original volume or capacity. This pressure and subsequent expansion sucks the liquid and causes it to enter the ball, passing on its way through the tubes *m*, *b*, and *f*, and raising the edges
85 of the circular valve *l*. The liquid having thus entered the hollow ball, if the latter be again compressed, the valve *l* is pressed against its seat, and the liquid is projected in a thin jet through the capillary-hole *n*.

Fig. 3 represents a stopper of the same sys- 90
tem as the one just described; but it is not provided with a plunging tube. In order to use this projector-stopper, it suffices to turn the flask upside down and to press the hol-
95 low ball and allow it to expand alternately.

We may naturally give any form or dimen-
sions to the ball, and the metallic parts of our apparatus may be composed of wood, ivory,
100 india-rubber, &c. Likewise the plunger-tube may be made of glass, of metal, wood, ivory, or any other material, or it may be altogether dispensed with, as has been above explained.

We claim—

The projector-stopper, either provided or not

with a plunger-tube, *m*, and consisting of the
cork proper, *a*, traversed by a tube, *b*, with a
flange, *c*, above which it is prolonged by the
wormed tube *d*, terminated by the spherical
5 cap *e*, the tubular piece *f*, screwing into the
tube *d* and surmounted by a spherical cap, *g*,
the arm *j*, dividing the cap *g* into two parts, and
forming the two openings *k*, the valve *l*, fixed
by its center on the arm *j*, and the hollow ball
10 *i*, provided with hole *n*, and held between the
two spherical pieces *e* and *g*, as above de-
scribed, and for the purpose set forth.

The foregoing specification of our new and
improved system of stopper for bottles and
flasks, called "projector-stopper," signed by 15
us this 5th day of July, 1884.

GEORGES PINAUD.

PIERRE GUICHARD.

Witnesses:

ROBT. M. HOOPER,

ALBERT MOREAU.