

(No Model.)

2 Sheets—Sheet 1.

J. R. WILSON.

CHEMICAL FIRE EXTINGUISHER.

No. 249,282.

Patented Nov. 8, 1881.

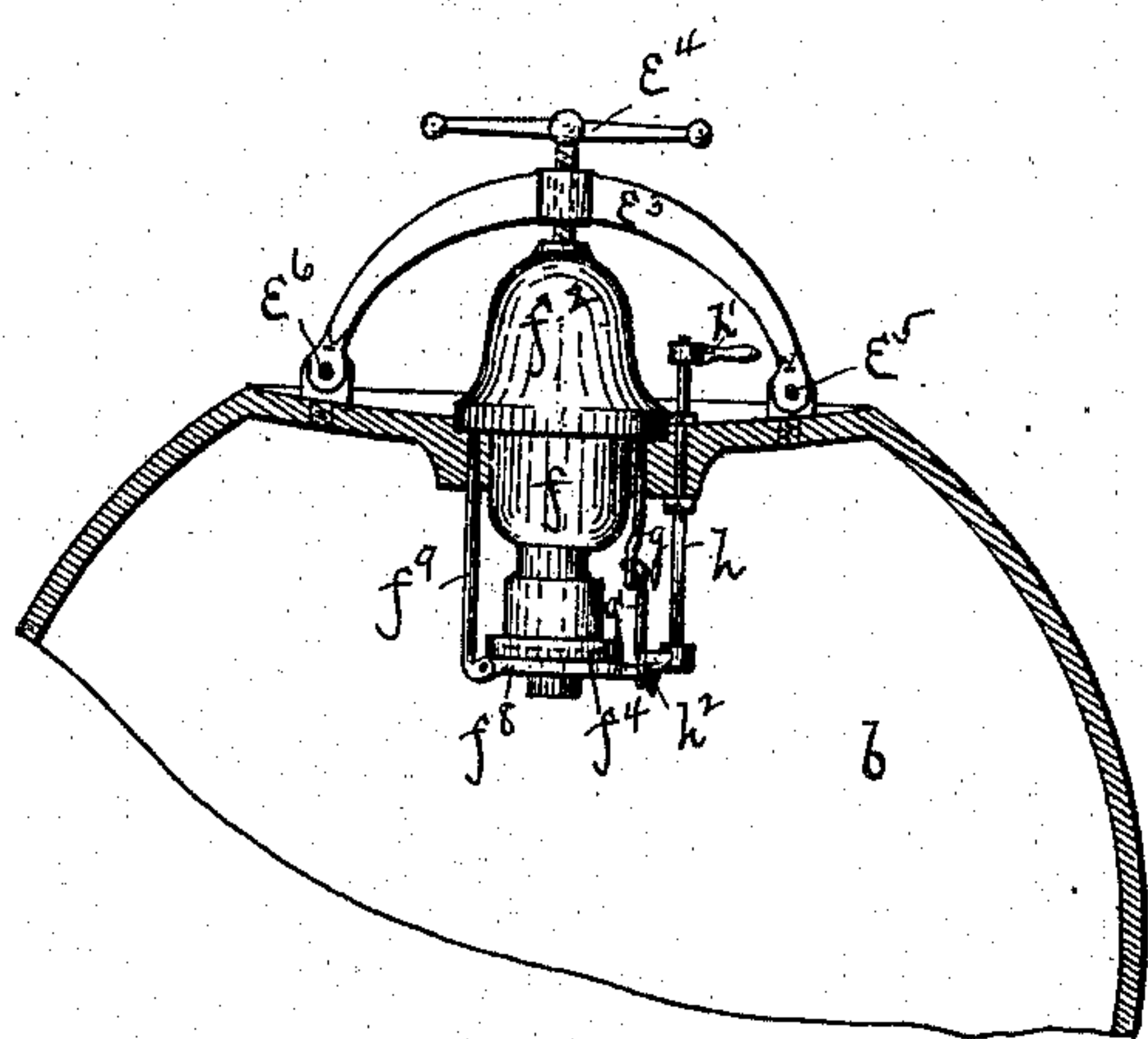
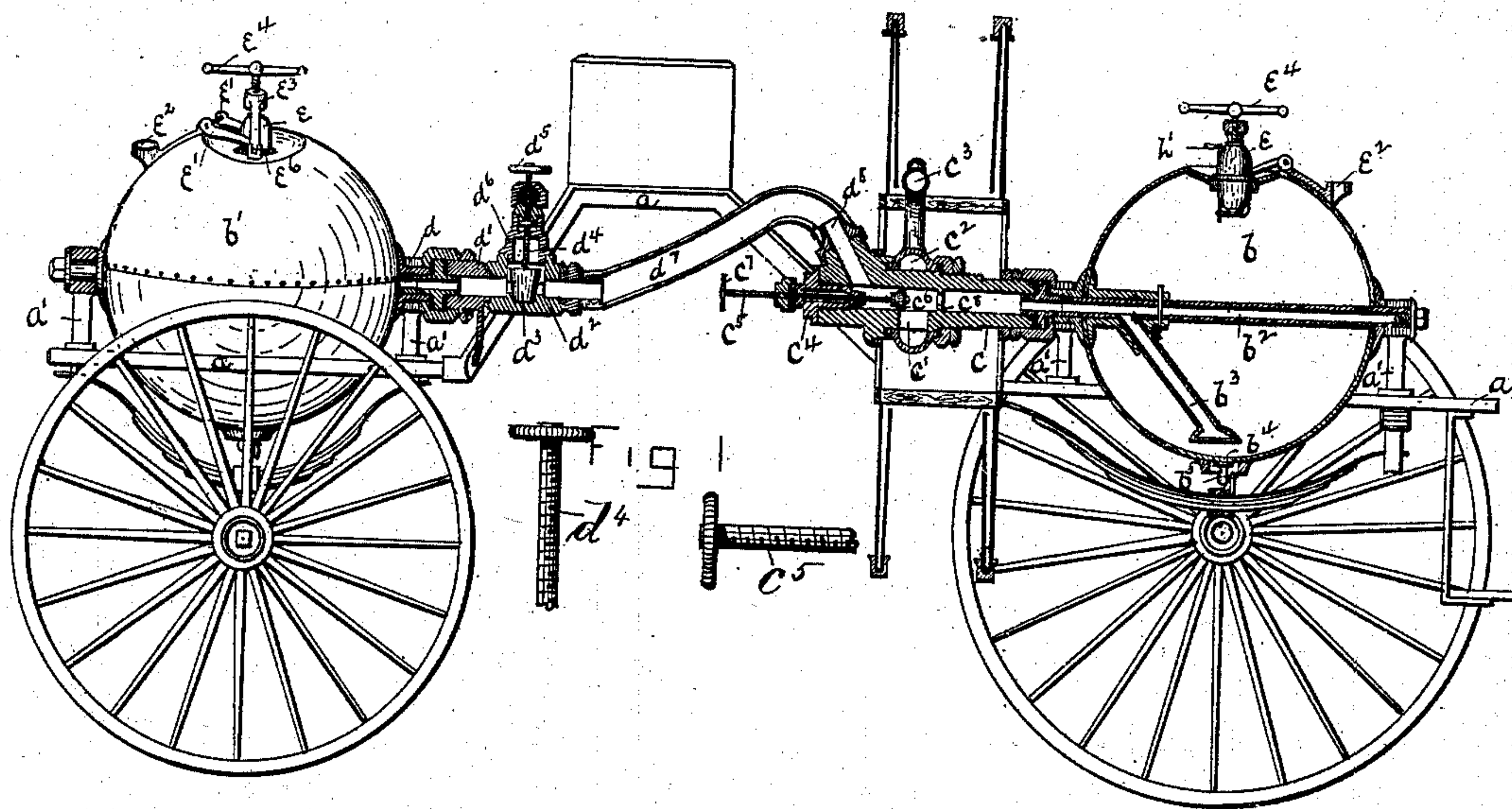


Fig 2

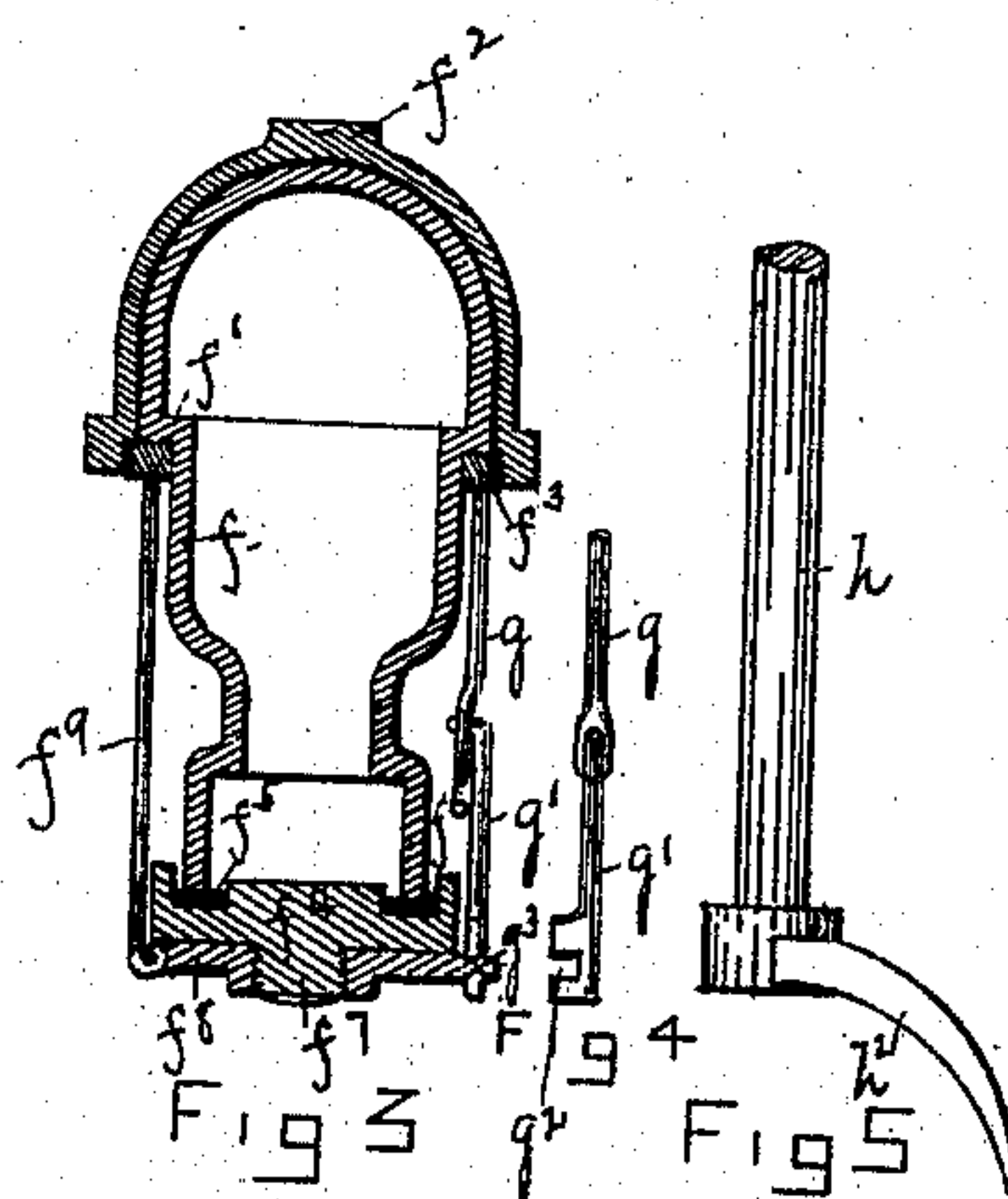


Fig 3

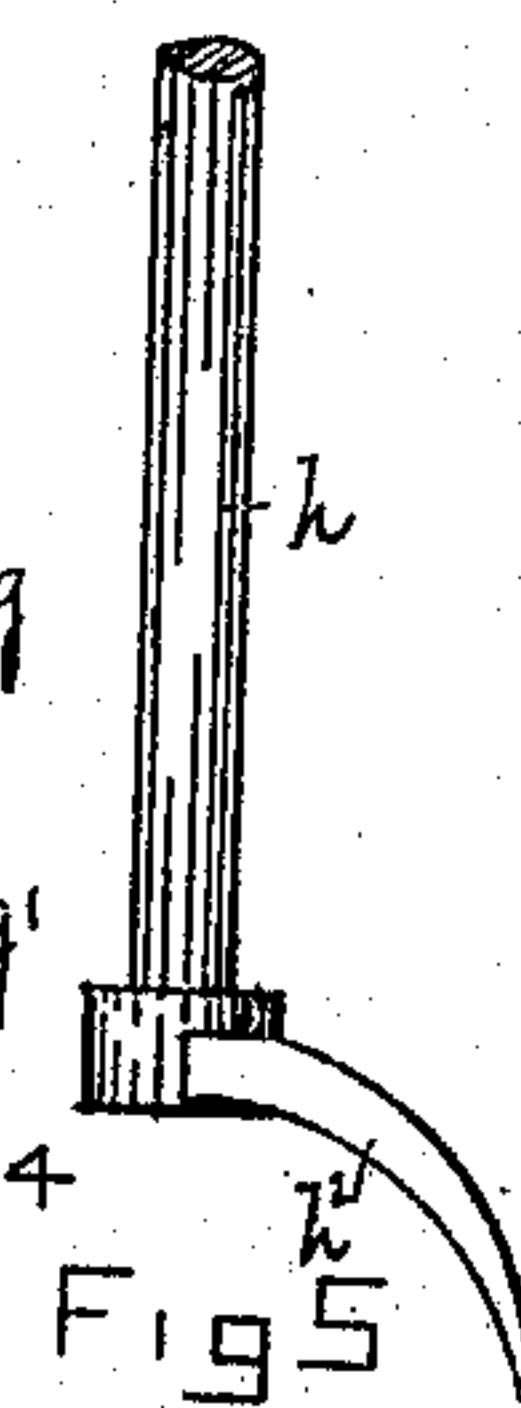


Fig 4

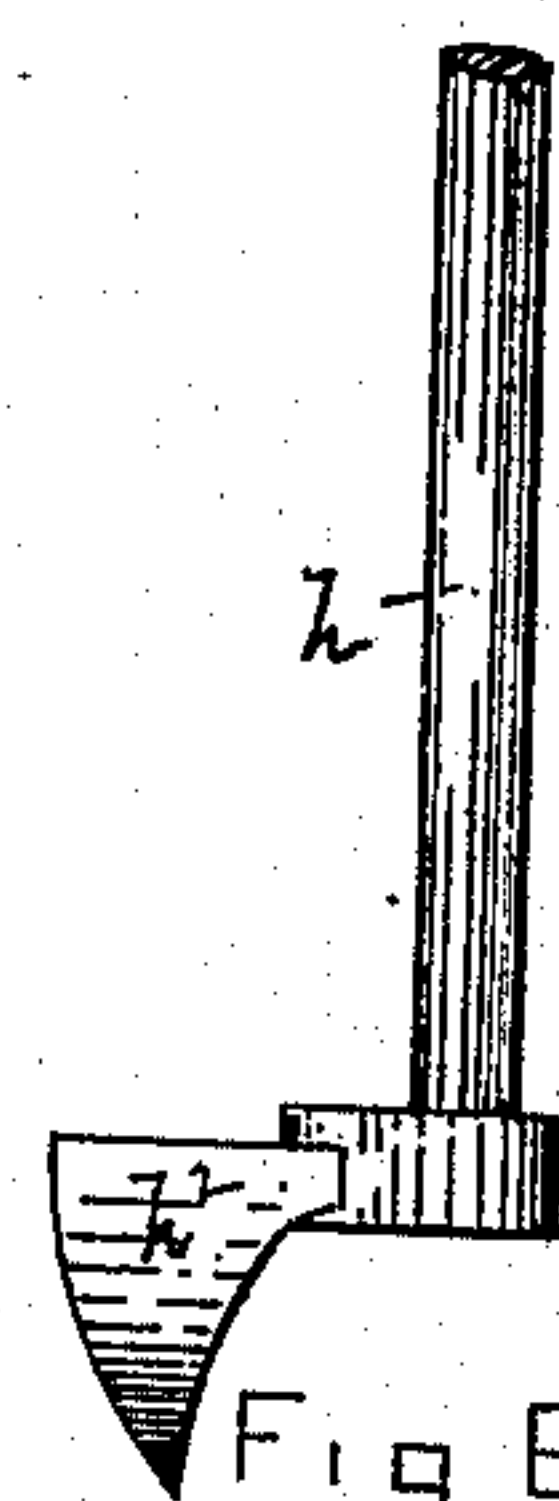


Fig 5

WITNESSES:

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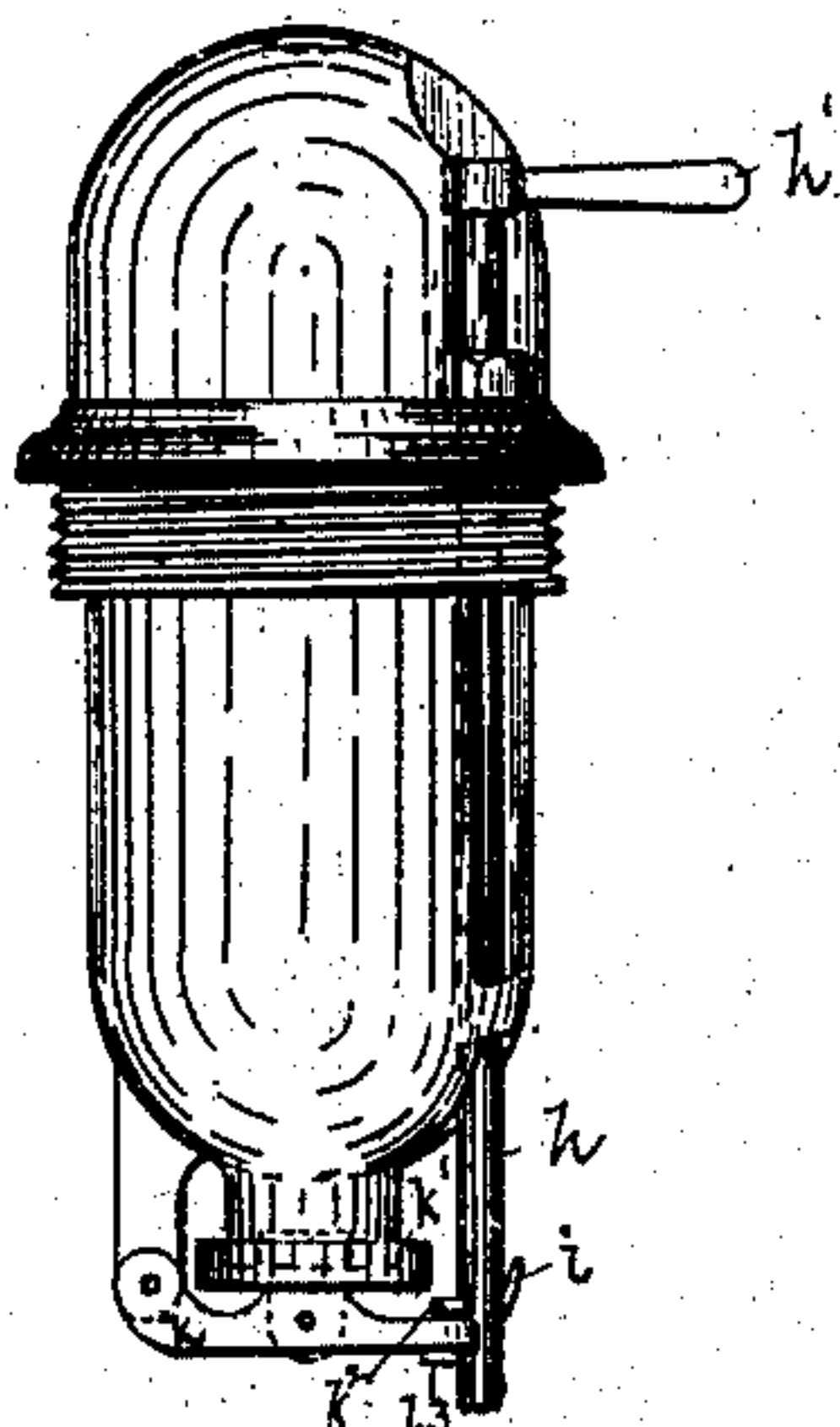


Fig 7

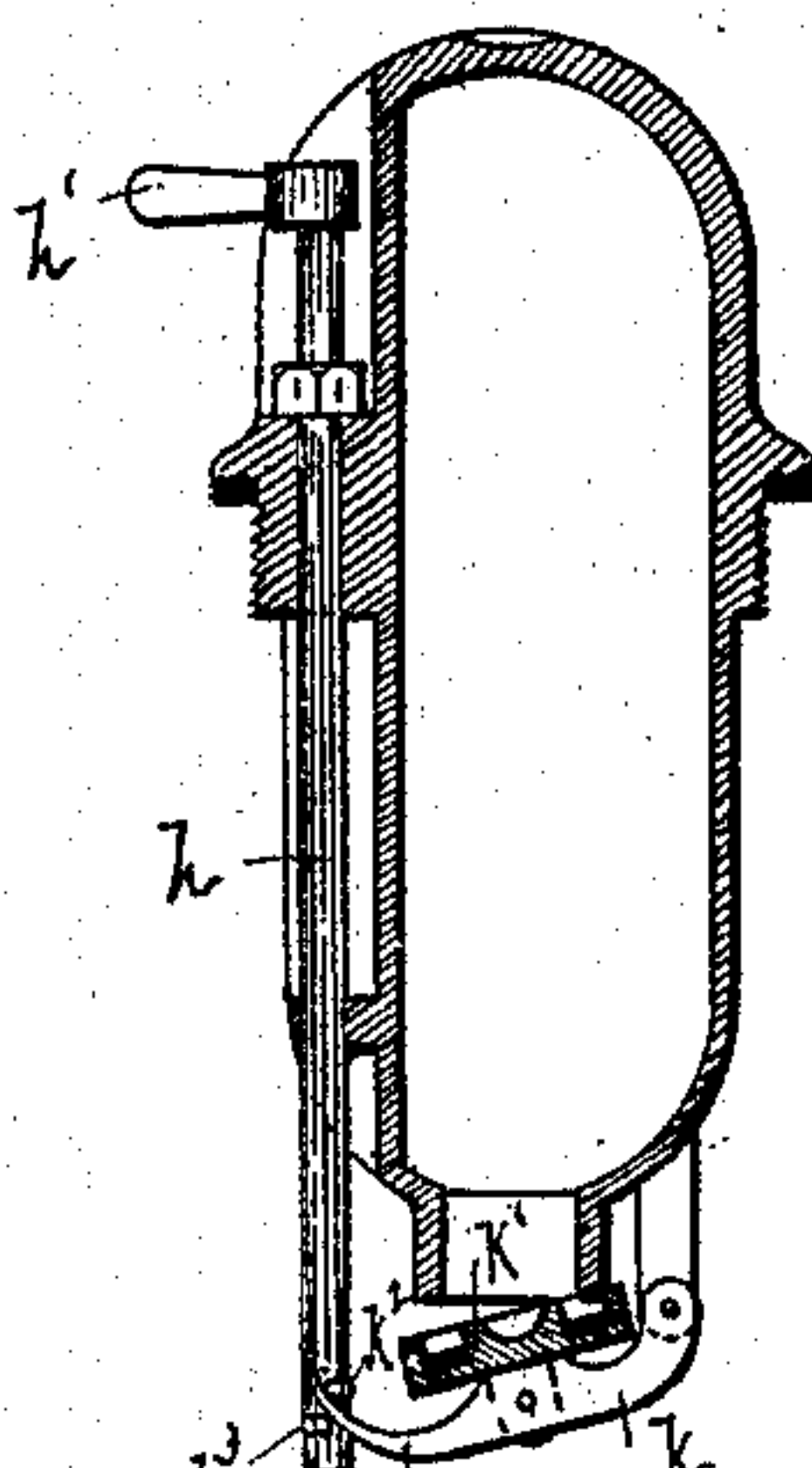


Fig 8

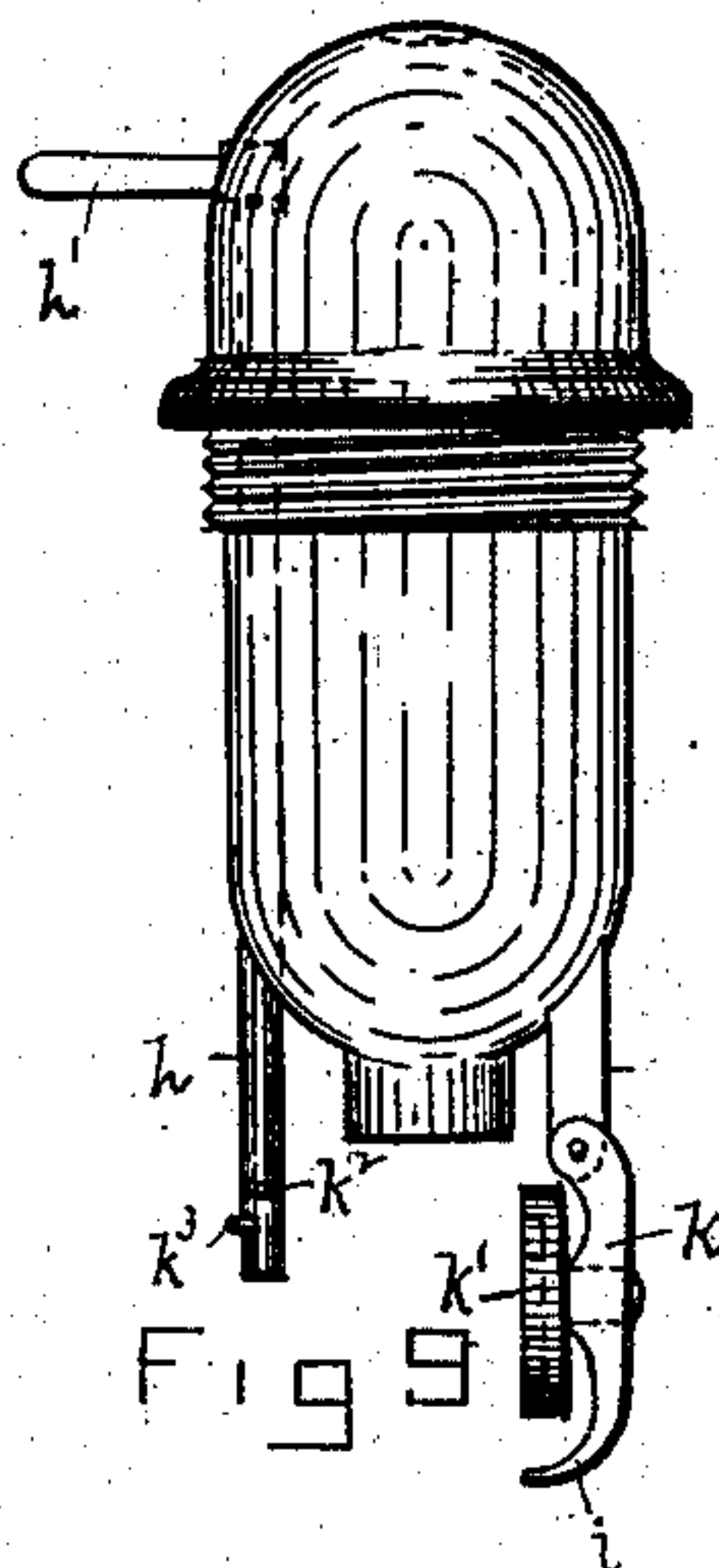


Fig 9

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# UNITED STATES PATENT OFFICE.

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## CHEMICAL FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 249,282, dated November 8, 1881.

Application filed August 18, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES R. WILSON, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Chemical Fire-Extinguishers; and I 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in chemical fire-extinguishers; and it consists, first, in a novel arrangement of connections between the two generating-vessels of a fire-extinguisher, by means of which the pressure generated in either vessel can be utilized independently of the other, or, if desired, the pressure of both vessels can be combined; second, an acid-receptacle and its cap or stopper made of annealed glass, and located partly without and partly within the generating-vessel, the exposed portion being protected by a removable metallic shield securely held in position by suitable means; third, devices for releasing and swinging open the hinged cap or stopper of the acid-receptacle, by means of which the discharge of the acid into the generator is at all times insured, no matter how much the parts to be separated adhere from corrosion or otherwise; fourth, in certain details of construction, which will be more fully hereinafter set forth and claimed.

In the drawings, Figure 1 is an elevation, partly in section, of a fire-extinguisher mounted upon wheels, and having two generators. Fig. 2 is an enlarged detail view of the glass acid-receptacle, showing the devices for securing it in position in the generator and for releasing and swinging open its hinged glass stopper. Fig. 3 is an enlarged sectional view of the detached acid-receptacle shown in Fig. 2. Figs. 4, 5, and 6 are detail views of the releasing devices shown in Fig. 3. Fig. 7 is a detached view of a metallic acid-receptacle, showing a modification of the releasing devices

shown in Fig. 2. Fig. 8 is a central longitudinal section of Fig. 7, showing the hinged stopper partially open. Fig. 9 is a view of the metallic acid-receptacle, showing the hinged stopper entirely open.

Referring to the drawings, *a* is the frame of the fire-extinguisher, suitably mounted upon wheels. To this frame are secured the uprights *a'*, which serve as bearings for the hollow axes of the spherical generators *b b'*. Each axle (one of which is shown at *b<sup>2</sup>* in Fig. 1) is tubular in form, and has the suction-pipe *b<sup>3</sup>*, leading therefrom to the bottom of the generator, just over the opening *b<sup>4</sup>*, provided with stop-cock *b<sup>5</sup>*, through which opening the contents of the generator may be removed when it is found necessary to cleanse it.

*c* is another hollow axle, which is so mounted in frame *a* as to form a continuation of the hollow axle *b'* of generator *b*. This axle *c* is provided with one or more openings, *c'*, which connect the hollow axle *c* with the annular chamber *c<sup>2</sup>*, provided with the discharge-pipe *c<sup>3</sup>*. The end of hollow axle *c* has screwed thereon a stopper, *c<sup>4</sup>*, in which works a screw-threaded stem, *c<sup>5</sup>*, the inner end of which is provided with a plunger, *c<sup>6</sup>*, which is moved back and forth in the hollow axle *c* by hand-wheel *c<sup>7</sup>*. The forward movement of plunger *c<sup>6</sup>* is limited by the annular shoulder *c<sup>8</sup>* in the hollow axle *c*, and when it is in contact with such shoulder it closes the generator *b* and prevents the escape of its contents. When it is moved back past the openings *c'* of axle *c* it permits the escape of the gas and liquid from the generator into the hollow axle *c*, thence through openings *c'* into annular chamber *c<sup>2</sup>*, and through discharge-pipe *c<sup>3</sup>* into the hose attached thereto. The generator *b'* is similarly mounted upon a hollow axle, one end of which shows in section at *d*. To the open end of this axle is secured the hollow cylinder *d'*, forming a continuation of said axle, and to this cylinder *d'* is screwed the stop-valve consisting of the cylindrical part *d<sup>2</sup>* and conical plunger *d<sup>3</sup>*, with its screw-threaded stem *d<sup>4</sup>*, which is operated by hand-wheel *d<sup>5</sup>* up and down in seat *d<sup>6</sup>*. This valve serves to regulate the discharge of the contents of generator *b'*, and is connected



with hollow axle  $c$  by means of hose  $d^7$ , one end of which is secured to the cylindrical part  $d^2$ , and the other end to the opening  $d^8$  in hollow axle  $c$ .

5 It will be seen that both generators are connected with the common discharge-pipe  $c^3$ , to which the hose is attached. If it is desired to utilize the contents of generator  $b$ , the plunger  $c^6$  is drawn back to the position shown in  
10 Fig. 1, thus allowing a free escape of gas and liquid into the hose attached to the discharge-pipe  $c^3$ , and at the same time preventing the escape of the contents of generator  $b'$ , even if by any chance the plunger  $d^3$  should be raised  
15 sufficiently to allow the escape of the gas and liquid from generator  $b'$ . It is intended, however, to control such discharge independently of the other generator by means of plunger  $d^3$ . Should it be found desirable to utilize the con-  
20 tents of generator  $b'$  alone, the plunger  $c^6$  is forced against the annular shoulder  $c^8$  in the hollow axle  $c$ , thus securely closing generator  $b$ , and the plunger  $d^3$  is raised a sufficient distance to allow the contents of generator  $b'$  to be forced  
25 out of the common discharge-pipe  $c^3$  into the attached hose. If the combined pressure of both generators is to be utilized, it will only be necessary to raise the plunger  $d^3$  and place the plunger  $c^6$  at the center of the opening  $c'$ , in  
30 which position the contents of the generators is permitted to pass by each side of the plunger  $c^6$  into the common annular recess  $c^2$  and discharge-pipe  $c^3$ .

35 In Patent No. 231,696, granted to me August 31, 1880, is shown an acid-receptacle, which is placed partially without and partially within the generator. The acid-receptacle therein described, being made substantially of brass, is quite expensive, and the devices employed for  
40 opening it, so that the contained acid may be discharged into the generator, have been found by experience to be unreliable at times, by means of corrosion and consequent adhesion of parts.

45 To avoid the above difficulties I have constructed my acid-receptacle and its cap or stopper of annealed glass, and provided it with means, hereinafter more fully described, by which the cap or stopper is released and swung  
50 open in such a manner as to entirely overcome the difficulty heretofore experienced.

In Fig. 1 the acid-receptacle  $e$  is shown as hung upon arms  $e'$ , hinged to the body of the generator, and adapted to be swung thereon out  
55 of the opening in which it rests when in place.

A rest,  $e^2$ , is provided, which holds the acid-receptacle in an inverted position, so that it can be readily charged with acid. When in position in the generator it is there securely  
60 held by a yoke,  $e^3$ , and binding-screw  $e^4$ . In my former patent this yoke was hinged at both sides; but I have found it more convenient to hinge it at one side only, so that it can be swung entirely to one side when not in use. It  
65 is shown in Fig. 2 as hinged at  $e^5$ , and provided with fastening-pin  $e^6$  to hold it in place.

In Fig. 3 I have shown the acid-receptacle  $f$

of annealed glass provided with shoulder  $f'$ . That portion of the glass receptacle which remains outside of the generator is protected by  
70 a cap or dome,  $f^2$ , which is screwed down upon an annular metallic ring,  $f^3$ , which rests in a groove cut around the opening in the generator, in which the acid-receptacle is placed. The shoulder  $f'$  of the glass receptacle rests  
75 upon this ring  $f^3$ , and is forced down tightly thereon by turning the screw  $e^4$  in the yoke  $e^3$ . The glass cap or stopper  $f^4$  has the circular groove  $f^5$ , in which is placed the packing  $f^6$ , against which the neck of the receptacle rests.  
80 On the under surface of this cap or stopper  $f^4$  is a screw-threaded projection,  $f^7$ , which screws into a circular plate,  $f^8$ , hinged to the depending rod  $f^9$ , which is secured to the annular ring  $f^3$ . This screw-threaded projection  $f^7$  provides  
85 for a proper adjustment of the glass cap  $f^4$ , to compensate for a change in length of the depending rods  $f^9$  and  $g$ , which are secured to the screw-threaded annular ring  $f^3$ .

Diametrically opposite to the point at which  
90 the rod  $f^9$  is secured is hung another and shorter rod,  $g$ , at the lower end of which is hinged the catch  $g'$ , slotted at  $g^2$ . This slot engages with a projection,  $g^3$ , on the plate  $f^8$ , and thereby holds the plate, with its attached  
95 cap or stopper  $f^4$ , firmly in position when the acid-receptacle is charged. To release this cap  $f^4$  and discharge the acid into the generator when necessary, I have provided a rod,  $h$ , (shown enlarged in Figs. 5 and 6,) which is pro-  
100 vided outside of the generator with the handle  $h'$ . At the lower end of rod  $h$ , and inside of the generator, I have placed the lever  $h^2$ , which projects from the side of rod  $h$  and curves outward and downward, as clearly shown in Figs.  
105 5 and 6. When this rod  $h$  is turned from the outside by the handle  $h'$  the projecting lever  $h^2$  strikes a shoulder on the hinged catch  $g'$ , just above the plate  $f^8$ , and throws it out of en-  
110 gagement with said plate. If the cap  $f^4$ , attached to plate  $f^8$ , should happen to adhere and remain in contact with the neck of the acid-receptacle, the curved lever  $h^2$ , as the rod  $h$  is further turned, will press down upon the shoulder  
115  $g^3$  and effectually release the cap, thus insuring in an entirely reliable manner the discharge of the acid into the generator.

The great uncertainty of a prompt opening of the class of acid-receptacles which do not  
120 require replacing entirely or partly after being used has heretofore been the chief obstacle to their utility. By my improved construction just described I have insured, in a thoroughly reliable manner, the opening at any  
125 and all times of the acid-receptacle, and by making it of annealed glass I have materially cheapened its cost, and at the same time have entirely avoided the corrosion consequent upon the use of metal.

I am aware that glass has heretofore been  
130 employed for holding the acid, but only where the receptacle has been placed entirely within the generator, in which case it has always been broken or mutilated when the acid was



discharged, and therefore incapacitated for further use. My glass receptacle is strong and reliable, and, being annealed, will not break under the pressure and heat generated by the action of the chemicals. It can be easily and expeditiously refilled with acid, and with careful handling will last as long as the metal receptacles of this class now in use.

In Figs. 7, 8, and 9 I have shown a modified form of device for releasing and swinging open the cap or stopper of the acid-receptacle. It is shown as applied to a metallic acid-receptacle. The only substantial change in the construction of this device from that shown in Figs. 2 and 3 is that the curved lever  $i$ , instead of being placed upon the rod, forms a part of the hinged cap-holder  $k$ , upon which is hinged the cap or stopper  $k'$ , and is curved upward instead of downward, as in Figs. 5 and 6. Two pins,  $k^2$   $k^3$ , are placed upon the rod  $h$ , the upper one of which,  $k^2$ , bears down upon the curved lever after the lower pin,  $k^3$ , has released such lever from engagement therewith. It will be seen that in both instances the curved lever serves to swing open the hinged cap after it has been released from engagement with the neck of the acid-receptacle.

The operation of my improved fire-extinguisher is as follows: The generators  $b$   $b'$  are charged with an alkali and water, and the receptacles  $e$  are filled with acid and closed and secured in position, as shown in Fig. 1. The plunger  $c^6$ , attached to stem  $c^5$ , is moved up against the annular shoulder  $c^8$ , which closes the generator  $b$ . The plunger  $d^3$  is moved down, so that it rests in the cylindrical part  $d^2$ , in which position it closes the generator  $b'$ . When it is desired to put the apparatus into operation, the handle  $h'$  on the outside of the generator is turned, thereby causing the lever  $h^2$  to strike the shoulder on the pivoted catch  $g'$ , swinging it to one side and releasing the circular plate  $f^8$ , and with it the cap or stopper  $f^4$ . If the cap  $f^4$  should not happen to adhere to the neck of the acid-receptacle, it immediately falls and releases the acid, which is discharged into the generator below, where the desired chemical action takes place. Should the parts adhere, which often occurs, the desired separation is effected by the curved portion of the lever  $h^2$ , which forces down the plate  $f^8$  and stopper  $f^4$ . In the modification shown in Figs. 7, 8, and 9, it will be seen that the curved lever  $i$ , although located differently, serves the same purpose—that of forcing down the hinged cap or stopper after it is released from engagement with the acid-receptacle—whenever these parts happen to adhere from corrosion or from any other cause.

It will be seen that by my improved construction there is no chance of the parts failing to operate as desired—a condition which insures the perfect working of the apparatus at all times.

The two generators  $b$   $b'$  are so arranged and connected with the common discharge-pipe  $c^3$ ,

as has already been fully explained, that the pressure generated therein can be used independently or combined, as deemed desirable.

It will be seen that by pivoting the yoke  $e^3$  on one side only it can, when not in use, be moved entirely to one side and without the space occupied by the acid-receptacle at the top of the generator, and is in this respect a great improvement on the yoke shown in my former patent, herein referred to.

I make no claim in this application to the form of reel shown in section in Fig. 1, as I wish to reserve such form of reel as subject-matter for a separate application to be made subsequently.

I claim—

1. In a chemical fire-extinguisher, the combination, with the generators  $b$   $b'$ , each provided with an acid-receptacle,  $e$ , and mounted upon hollow axles  $b^2$ , of the tubular connections  $d^2$   $d^7$   $d^8$   $c$ , the plungers  $d^3$   $c^6$ , with their screw-threaded stems  $d^4$   $c^5$  and hand-wheels  $d^5$   $c^7$ , and the annular chamber  $c^2$  and discharge-pipe  $c^3$ , substantially as shown and described.

2. In a chemical fire-extinguisher, the acid-receptacle  $e$ , hinged to the generator, and adapted to be swung out of position in such generator and upon the rest  $e^2$ , secured to the wall of the generator, the rest  $e^2$  being adapted to hold the acid-receptacle in an inverted position, so that it can be conveniently filled with acid, substantially as shown and described.

3. In a chemical fire-extinguisher, an acid-receptacle and its cap or stopper, made of annealed glass, and located partly without and partly within the generator, the cap or stopper being hinged to the receptacle, substantially as shown and described.

4. In a chemical fire-extinguisher, an acid-receptacle and its cap or stopper, made of annealed glass, and located partly without and partly within the generator, and protected on the outside by a removable inclosing-shield, the cap or stopper being hinged to the receptacle and released and swung open by devices located within the generator and operated from the outside thereof, substantially as shown and described.

5. In a chemical fire-extinguisher, the combination of the acid-receptacle and its cap or stopper with the hinged plate to which the cap is secured, and the curved lever operating with suitable devices to release and swing open said cap, so that the contained acid may be discharged into the generator, substantially as shown and described.

6. In a chemical fire-extinguisher, the combination of the acid-receptacle  $e$  and its cap or stopper  $f^4$  with the rod  $f^9$ , to which is hinged the cap-plate  $f^8$ , the rod  $g$ , to which is hinged the slotted catch  $g'$ , the slot  $g^2$  of which engages with a projection,  $g^3$ , on the cap-plate  $f^8$ , and the rod  $h$ , provided at its lower end with the curved lever  $h^2$ , for releasing and swinging open the cap or stopper, substantially as shown and described.



7. In a chemical fire-extinguisher, a cap or stopper,  $f^4$ , for an acid - receptacle, provided with a screw-threaded projection,  $f^7$ , which permits of its adjustment in the hinged plate  $f^8$ ,  
5 to which it is secured, as and for the purpose stated.

8. As a means of securing the acid receptacle in position in the generator of a fire-extinguisher, the yoke  $e^3$  and binding-screw  $e^4$ , the

yoke being hinged on one side only, and provided on the other side with fastening-pin  $e^6$ , so that when not in use the yoke may be swung entirely to one side, substantially as shown and described.

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Witnesses:

HENRY T. SMITH,  
W. T. MILLER.