

(No Model.)

J. D. BOWNE.
FILTER.

No. 602,720.

Patented Apr. 19, 1898.

Fig. 1.

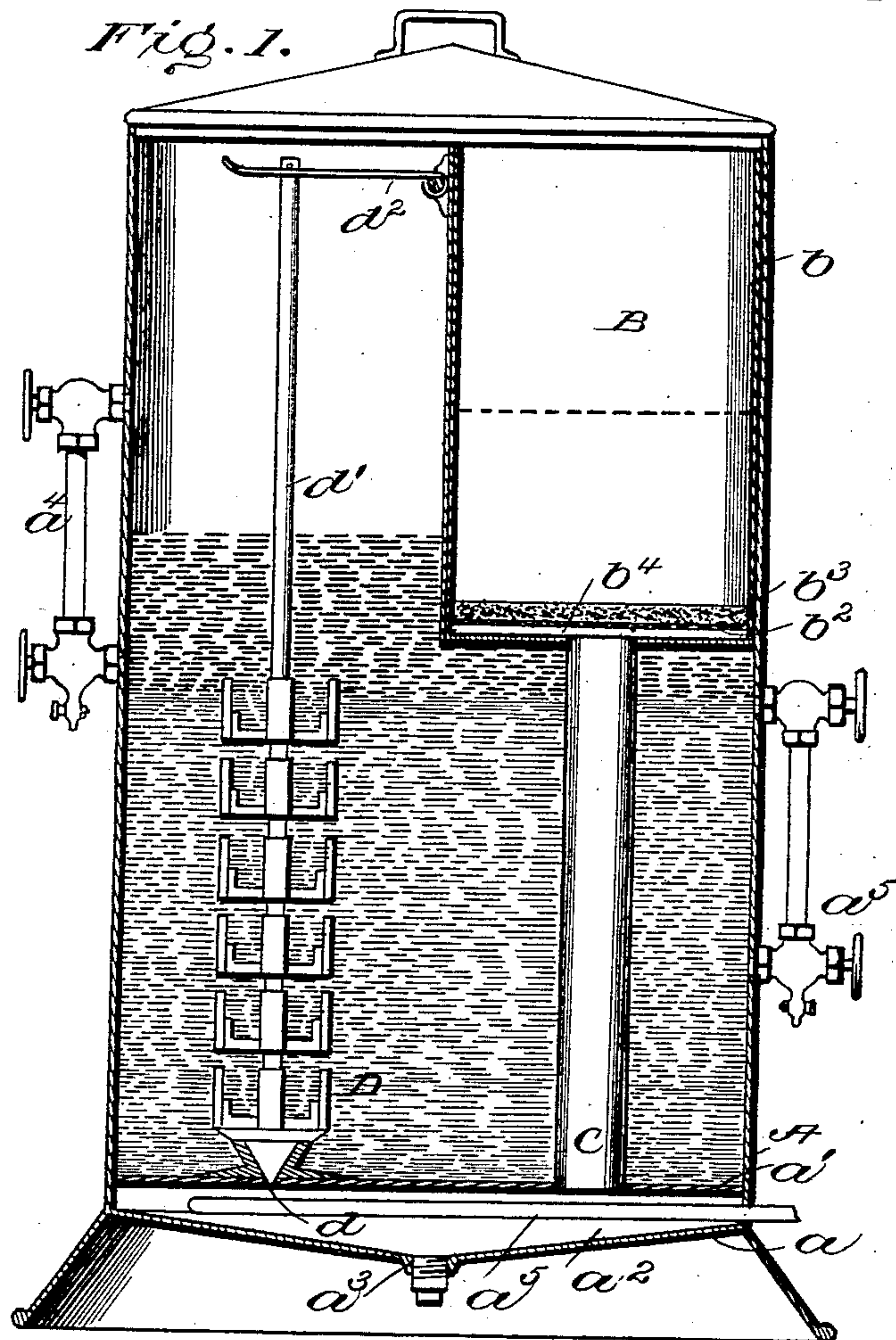


Fig. 3.

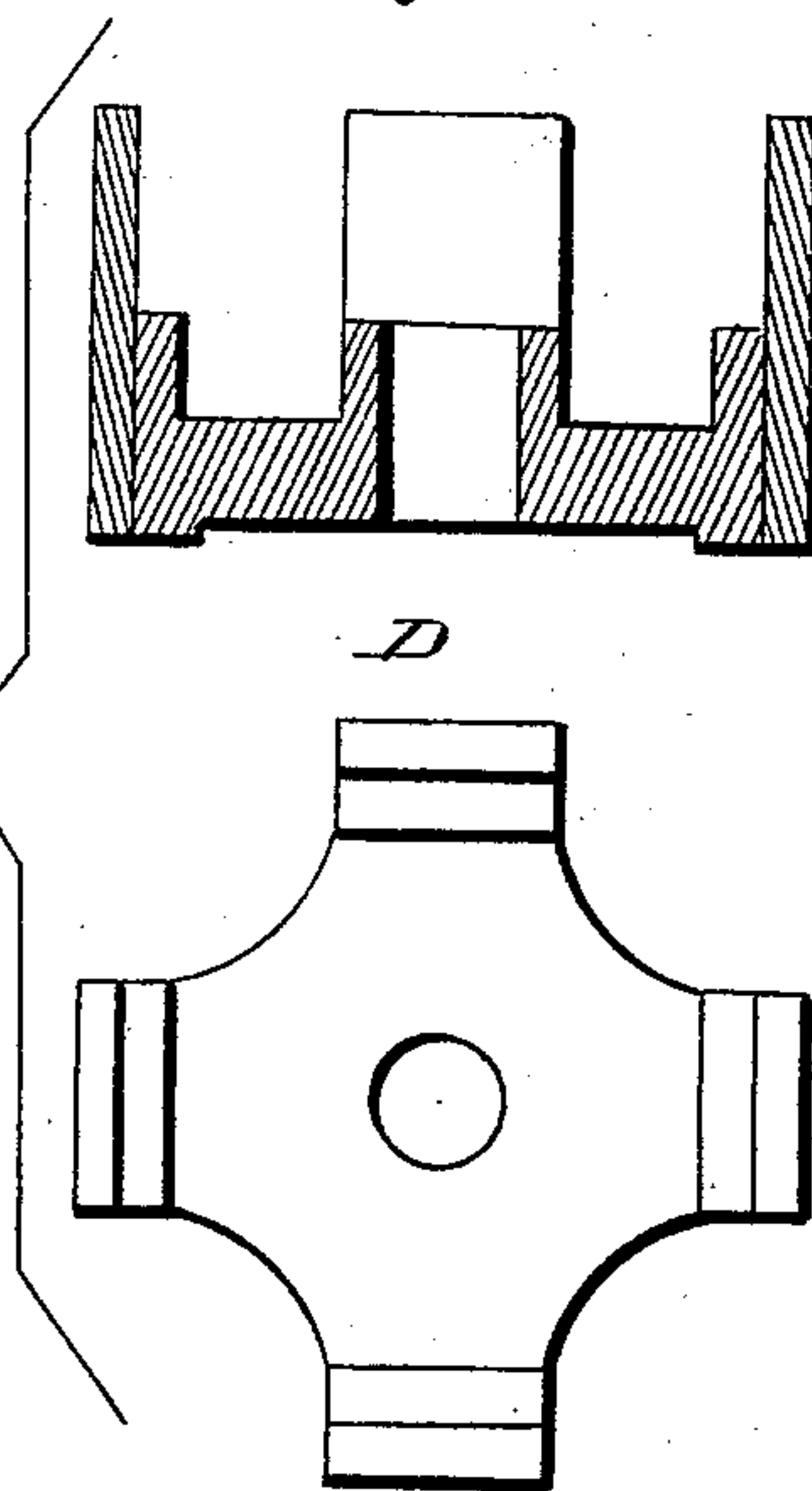


Fig. 4.

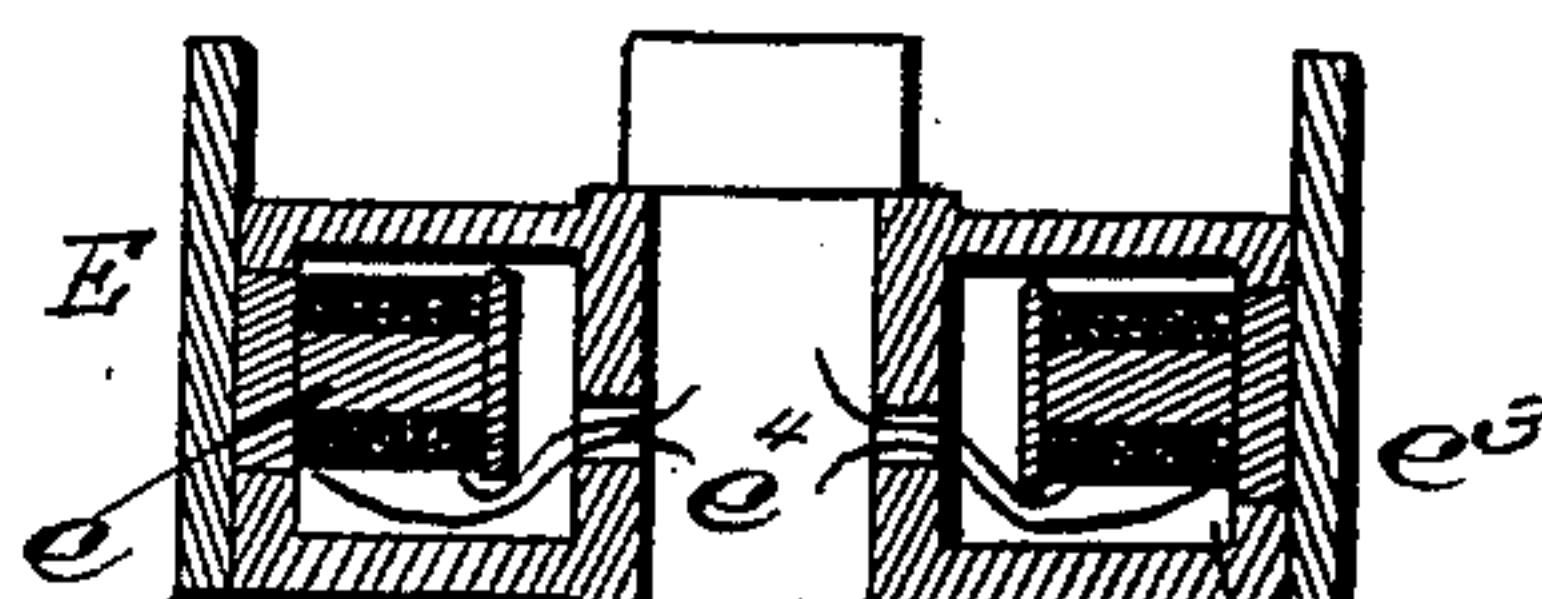


Fig. 5.

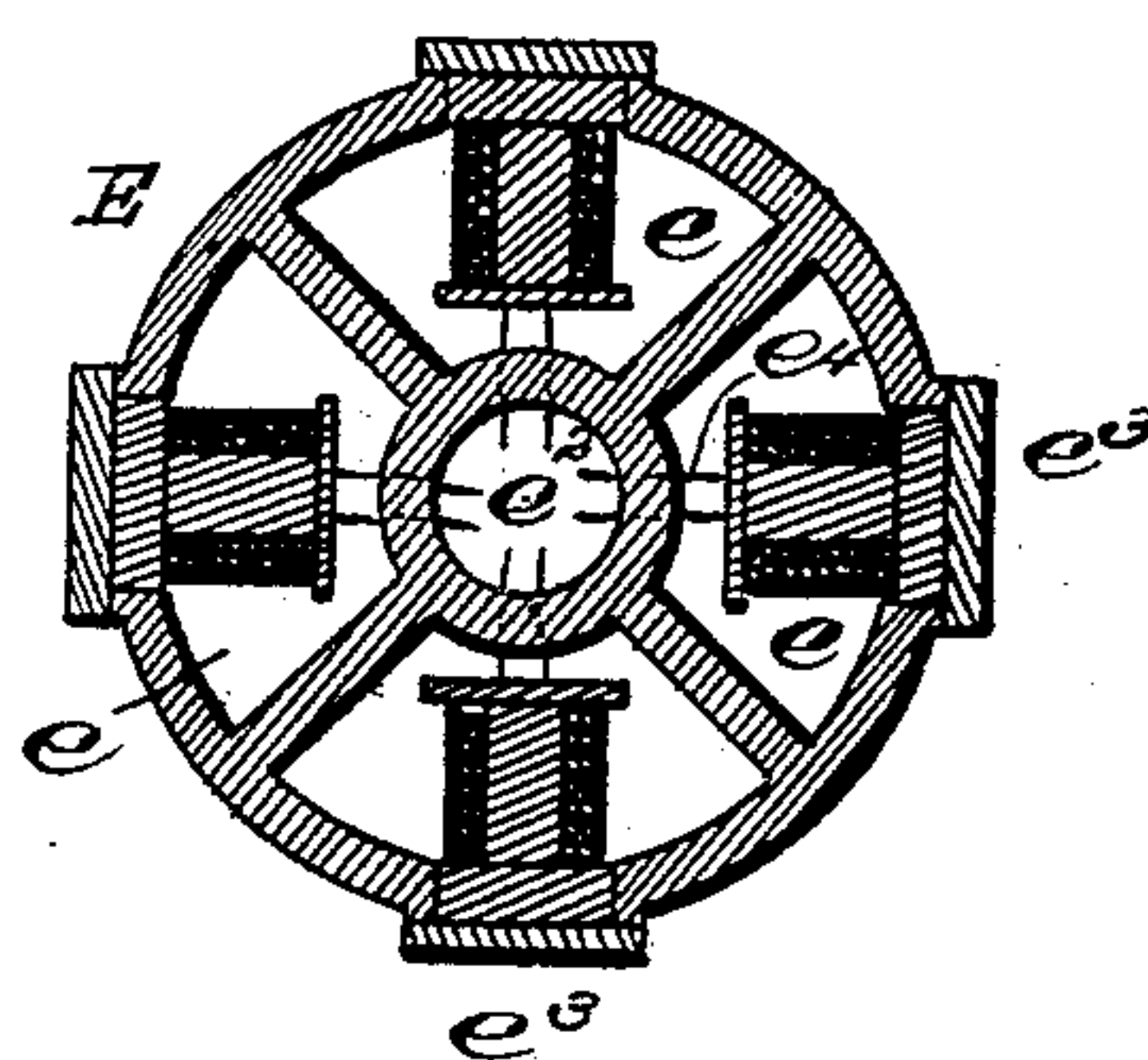
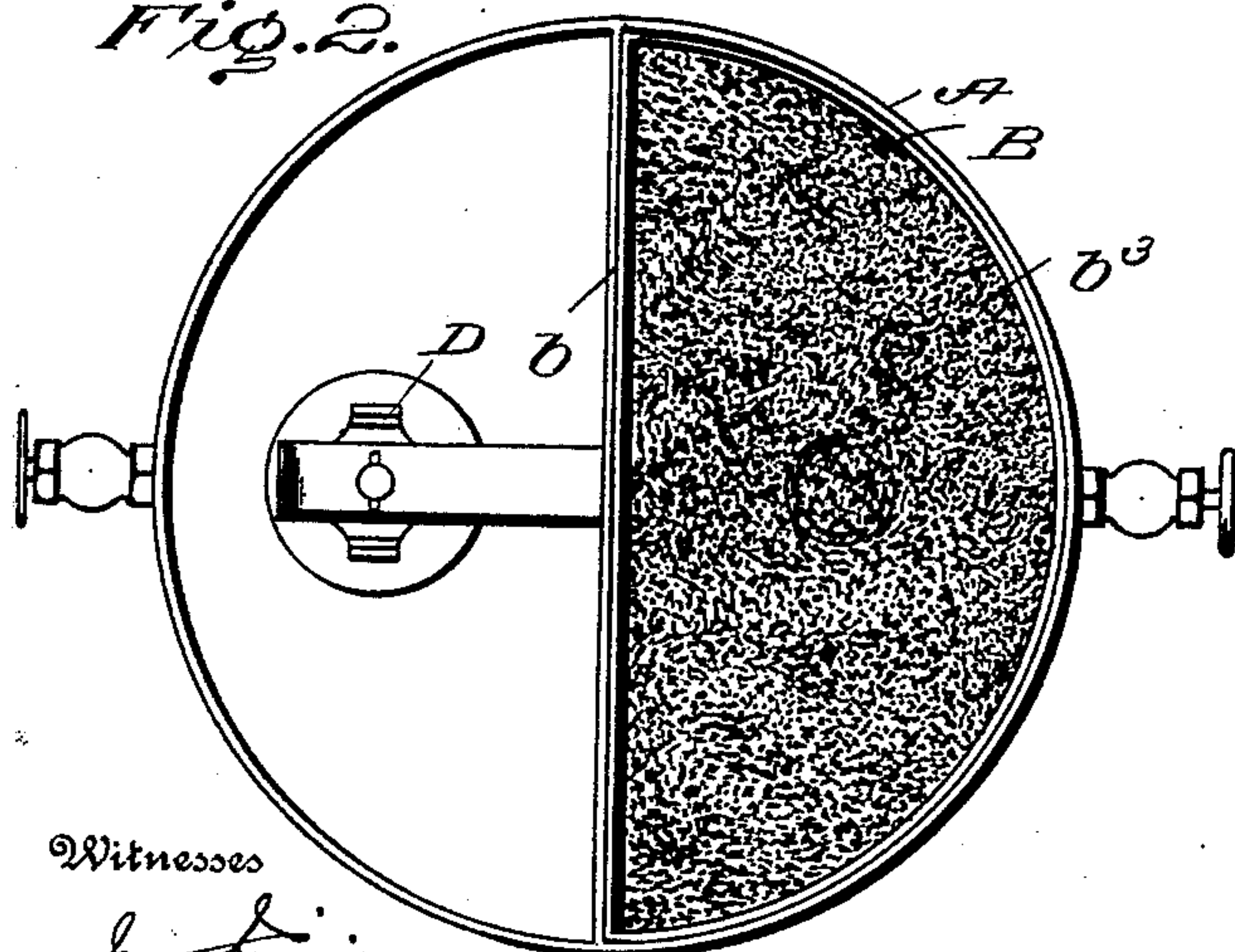


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN D. BOWNE, OF NEW YORK, N. Y., ASSIGNOR TO JAMES L. ROBERTSON,
OF SAME PLACE.

FILTER.

SPECIFICATION forming part of Letters Patent No. 602,720, dated April 19, 1898.

Application filed August 3, 1897. Serial No. 646,897. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. BOWNE, of New York, in the county of New York and State of New York, have invented certain new and
5 useful Improvements in Filters; 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.

10 This invention contemplates certain new and useful improvements in filters, having reference to that class employed for effecting the separation of oil and water, whereby what is ordinarily refuse oil can be reused time and
15 again.

The primary object of the invention is to insure the separation or removal of all metallic and other substances ordinarily held in suspension. This I accomplish by means of
20 a magnet, or series thereof, along or against which the filtered oil and water will travel. It is well known that particles of metal in suspension will adhere to each other, and hence when the sensitive metals are attracted
25 the others will continue to cling to them. In the filtering-bed I preferably provide magnetic iron ore to aid in effecting the separation of the metallic particles. The filtered oil passes through a heating-chamber, so as to
30 add to the volatility of the oil and cause the same to rise in globules through water in the filtering-tank.

The invention will be hereinafter fully set forth, and particularly pointed out in the
35 claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view of a filter constructed in accordance with my invention. Fig. 2 is a plan view with the top or
40 cover removed. Fig. 3 shows details. Figs. 4 and 5 are respectively vertical and horizontal sectional views of a slight modification.

Referring to the drawings, A designates a tank or vessel having a lower inclined bottom
45 a and a flat false bottom a' , forming an intermediate chamber a^2 . Sediment accumulating within this chamber may be worked out through a central opening a^3 in bottom a . To the exterior of tank A are secured suitable
50 gages and draw-off cocks $a^4 a^5$. Within cham-

ber a^2 is located a coil a^5 of steam-pipe, the same being extended inward through the wall of the tank and leading from any suitable source of steam-supply. By this means the chamber a^2 can be heated to the desired de-
55 gree of temperature for the purpose of adding volatility to the filtered oil and form the same into globules, which will readily rise in the tank.

B is a removable vessel located within a cor-
60 respondingly-shaped chamber b within the upper portion of tank A. This vessel is shown as being hemispherical in horizontal cross-section and extending half-way down in tank A. The bottom b' of this vessel is composed
65 of a wire-netting b^2 , upon which rests the filtering-bed b^3 . The latter is preferably composed of or has in its constituency magnetic iron ore, although bone-charcoal, waste, or fabric of any kind may be used. The cham-
70 ber b is connected with the heating-chamber a^2 by one or more pipes. I have shown a pipe C extending from the center of the bottom b^4 through false bottom a' and opening into chamber a^2 . Thus it will be seen that the oil
75 and water in vessel B will percolate through the filtering-bed and down through the pipe or pipes C to the chamber a^2 , where it will be heated by the heat from the steam-pipe, caus-
80 ing the heavy oil to lighten up or become more volatile, resulting in the formation of globules, which will gradually rise and pass through an opening d in false bottom a' up in the tank A. The oil will rise in globules,
85 which will travel to the upper surface of the water in said tank, from which point it can be drawn off.

Within tank A, I contemplate employing one or more magnets so arranged that the globules of oil rising from the heated cham-
90 ber will be caused to come in contact therewith, so that any metallic substance held in suspension in the oil will be attracted by the magnets and caused to adhere thereto. These magnets may be of any kind or shape,
95 and in some instances it may be deemed advisable to employ electromagnets, in which case the magnets may be electrified by any suitable means.

In Fig. 1 I have shown a series of perma- 100

nent magnets D, mounted on a perpendicular rod d' , which is suspended from a horizontal arm d^2 , secured to the straight wall of chamber b . The lowermost magnet rests in close
5 juxtaposition to the passage-way in false bottom a' , so as to insure contact of the rising globules of oil as they enter tank A.

The ordinary magnets will as a general rule answer all purposes required, yet if greater
10 intensity is desired electromagnets E may be employed. I have shown such magnets in Figs. 4 and 5. In this form the electromagnets e are located in cored chambers e' of a hub e^2 , the contact-plates e^3 being connected to the
15 magnets and located at the ends of the chambers. These chambers are made water and oil proof to prevent short-circuiting. The connecting-wires e^4 lead from each magnet into the hub, where they may be united to the
20 main wires leading from the electrical generator.

In Fig. 1 I have indicated the water-level in tank A and also the oil-level. In practice the unfiltered oil and water being placed in
25 vessel B will filter through the bed on the bottom of said vessel. The magnetic iron ore serves to aid in removing metallic substances. The filtered oil and water will pass down through pipe C into chamber a^2 , and the heat
30 generated in the latter by the steam-pipe will add to the volatility of the oil and cause it to form into globules, and being lighter than the water the same will gravitate to the passage-way into the tank, and upon rising there-
35 in will have direct contact with the magnets. All metallic matter held in suspension and not separated in passing through the filtering material will cling to these magnets. In its upward course through the body of water
40 in tank A the oil is still further cleaned and washed, and hence when it reaches the water-level it is in a pure and perfect condition ready for reuse for any and all purposes.

The advantages of my invention are appar-
45 ent to those skilled in the art.

It will be observed that I have provided extremely simple means for effecting the thorough cleansing of refuse oil, thereby per-
50 mitting the same to be reused. By the employment of magnetic iron ore as a component of the filtering-bed metallic substances contained in the oil are removed; but should any such substance pass through the bed and
55 cling to the oil-globules as they rise from the heating-chamber all such will adhere to the magnets, the globules being brought into direct contact with the latter.

It will also be observed that by arranging the magnets in a vertical series the globules
60 of oil successively contact therewith as they rise or pass upward through the water in the tank, whereby the action of said magnets is continuous. This operation is further aided by placing said magnets directly above the
65 inlet from the heating-chamber.

It will also be observed that all the parts are readily accessible, and hence can be

quickly and easily cleaned. The refuse col-
lected within the heating-chamber can be
washed therefrom through the opening in the
70 inclined bottom, and the magnets can be easily removed for the purpose of effecting the removal of all particles adhering thereto.

The filter is entirely devoid of all complica-
75 tion, and it insures quick and thorough filtration of refuse oil.

I claim as my invention—

1. An oil-filter having a passage-way for the filtered oil, and a series of vertically-ar-
80 ranged magnets in juxtaposition to said passage-way, as and for the purpose stated.

2. An oil-filter having a heated chamber, a passage-way for the oil leading from said
85 chamber, and a series of vertically-arranged magnets located directly above and in juxtaposition to said passage-way, substantially as set forth.

3. An oil-filter comprising a tank having an elevated filtering vessel located therein, a
90 lower heated chamber with which said vessel is in communication, a passage-way leading from said chamber, and a vertically-arranged series of magnets suspended above said pas-
95 sage-way and arranged in juxtaposition thereto, substantially as set forth.

4. A filter comprising a tank having a lower chamber, an outlet leading therefrom into
100 said tank, a vertically-arranged series of magnets located above said outlet in juxtaposition thereto, a heating medium within said chamber, and a filtering vessel located in said
105 tank and communicating with said heating-chamber, said filtering vessel being provided with a filtering-bed of magnetic ore, substantially as set forth.

5. The herein-described filter comprising the tank having a false bottom formed with
110 an opening, a heating medium beneath said false bottom, a series of magnets in said tank in line with said opening, and a filtering vessel in the upper part of said tank connecting
115 with the space beneath said false bottom, substantially as set forth.

6. The combination with the tank having an upper chamber, and a false bottom form-
120 ing a lower chamber, a pipe connecting said chambers, a filtering vessel located in said upper chamber, a heating-pipe in said lower chamber, and a series of magnets in said tank above an opening in said false bottom, sub-
125 stantially as set forth.

7. The combination with the tank having an upper chamber, and a false bottom form-
130 ing a lower chamber, a pipe connecting said chambers, a filtering vessel located in said upper chamber, a heating medium in said lower chamber, a series of magnets, and a rod in said tank on which said magnets are located, substantially as set forth.

8. The filter for oil, herein described, com-
135 prising the tank having an upper chamber and a lower chamber in communication therewith, a vessel fitted in said upper chamber having a foraminous bottom and a filtering-

(No Model.)

M. BOYER.
PUNCHING MACHINE.

No. 602,721.

Patented Apr. 19, 1898.

Fig. 1.

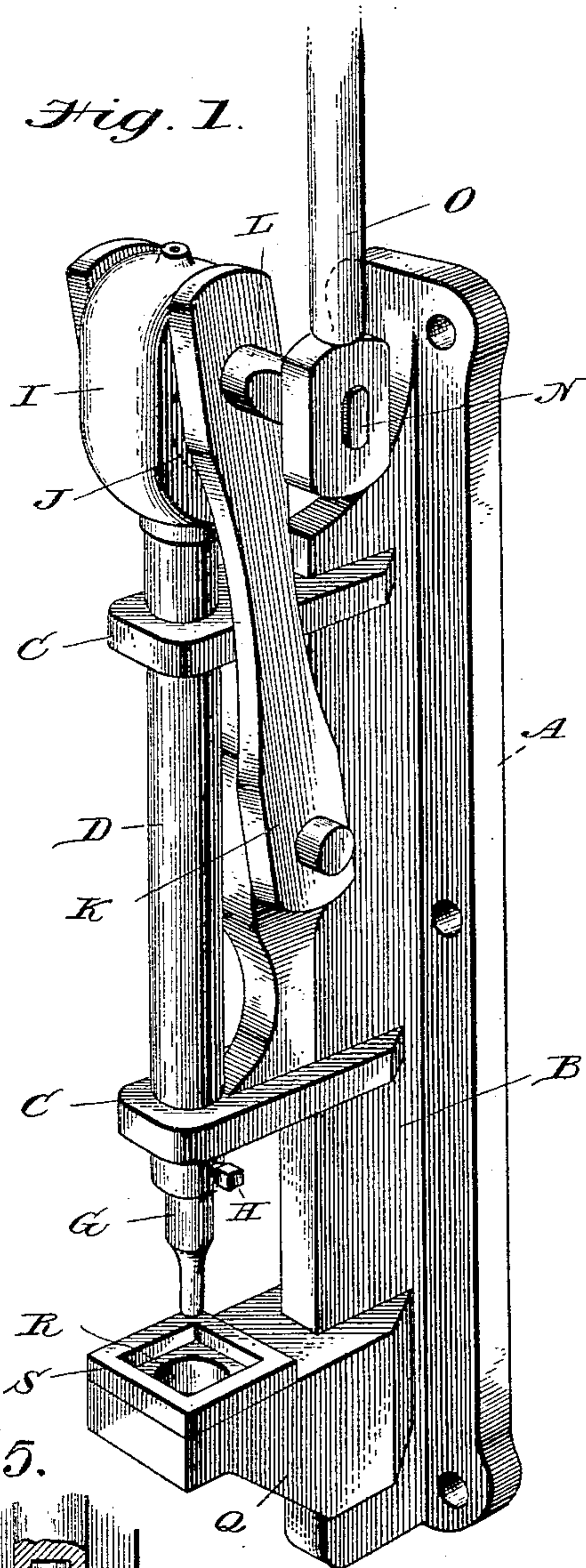


Fig. 2.

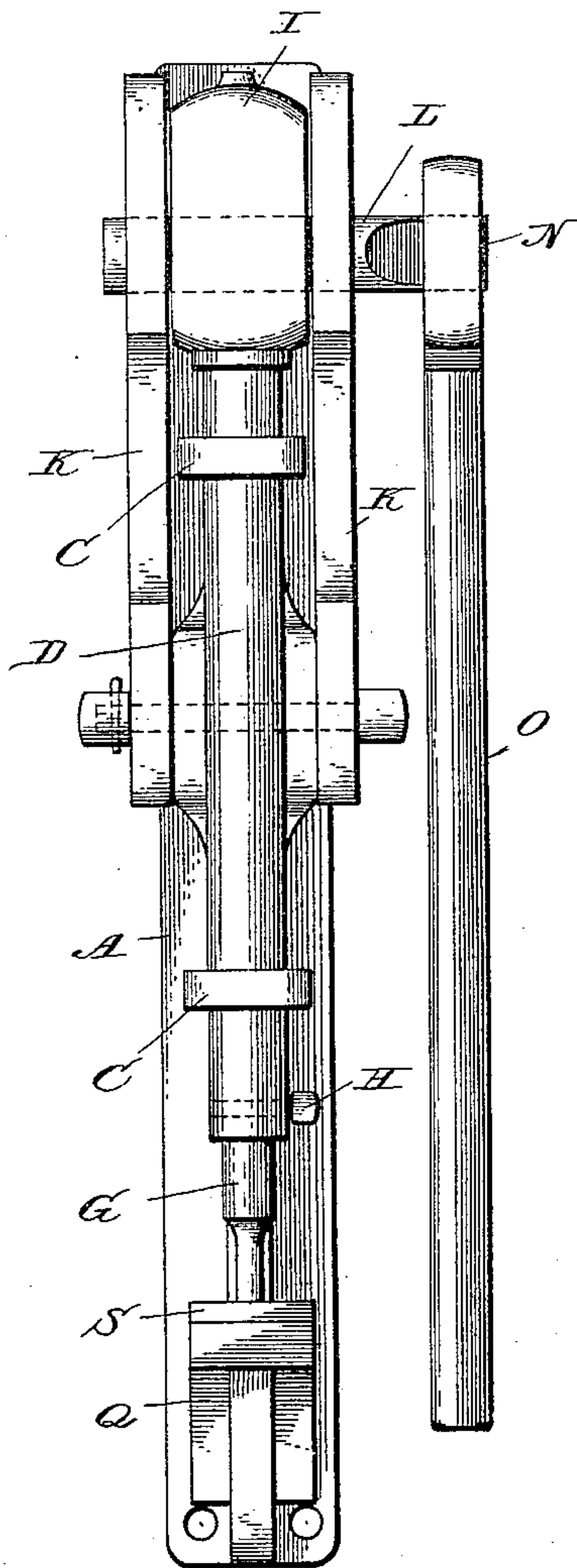


Fig. 5.

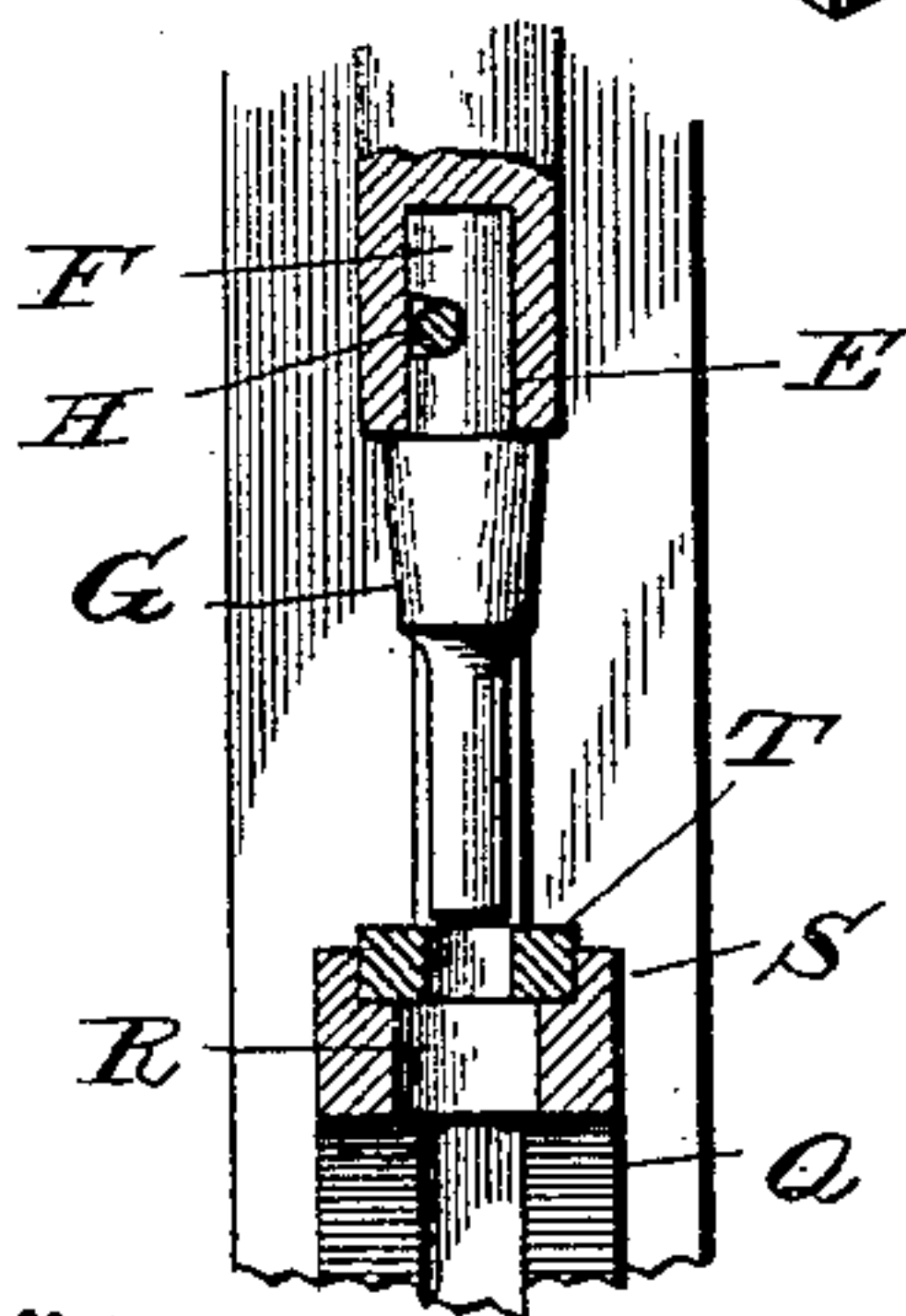


Fig. 3.

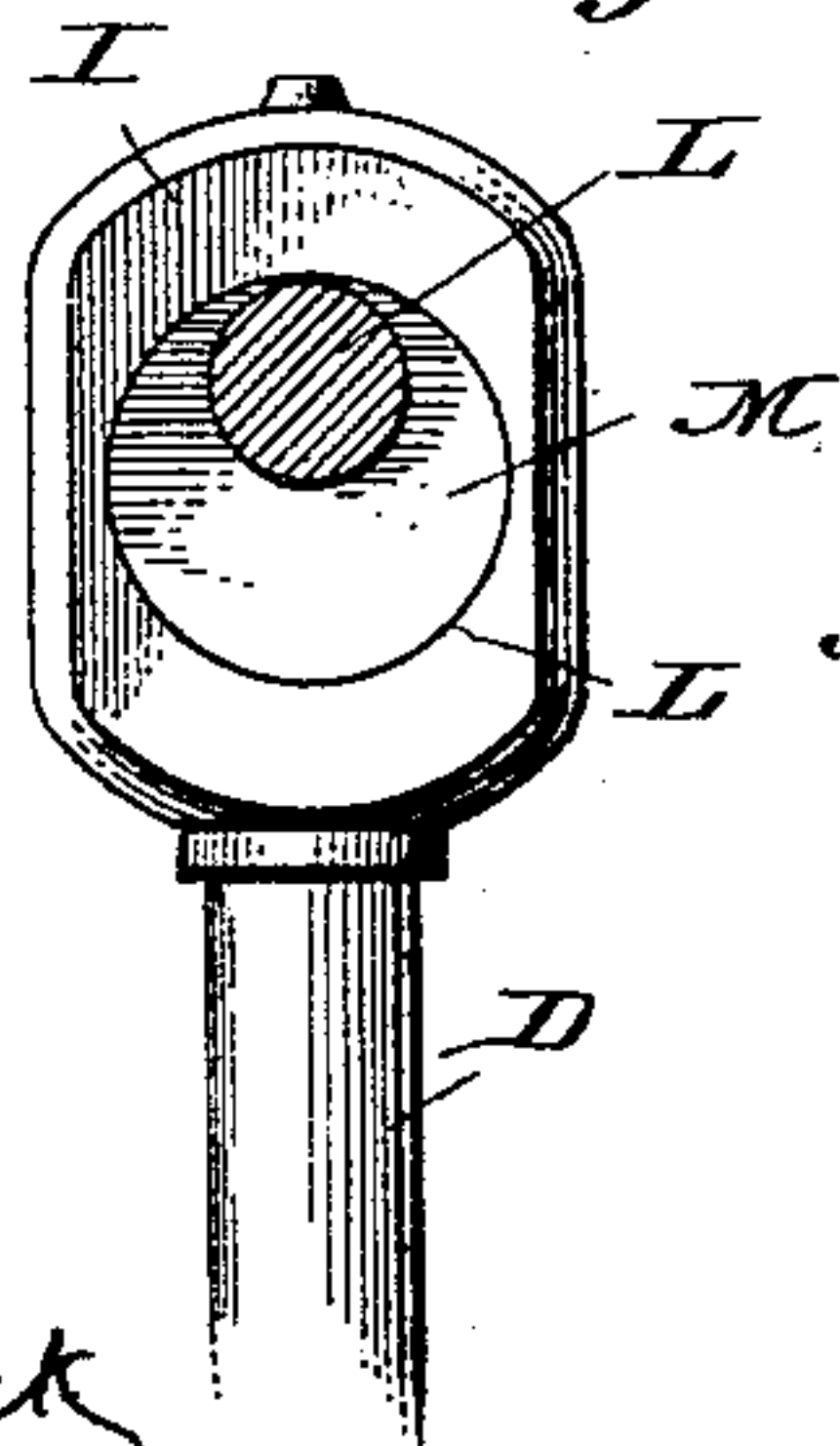
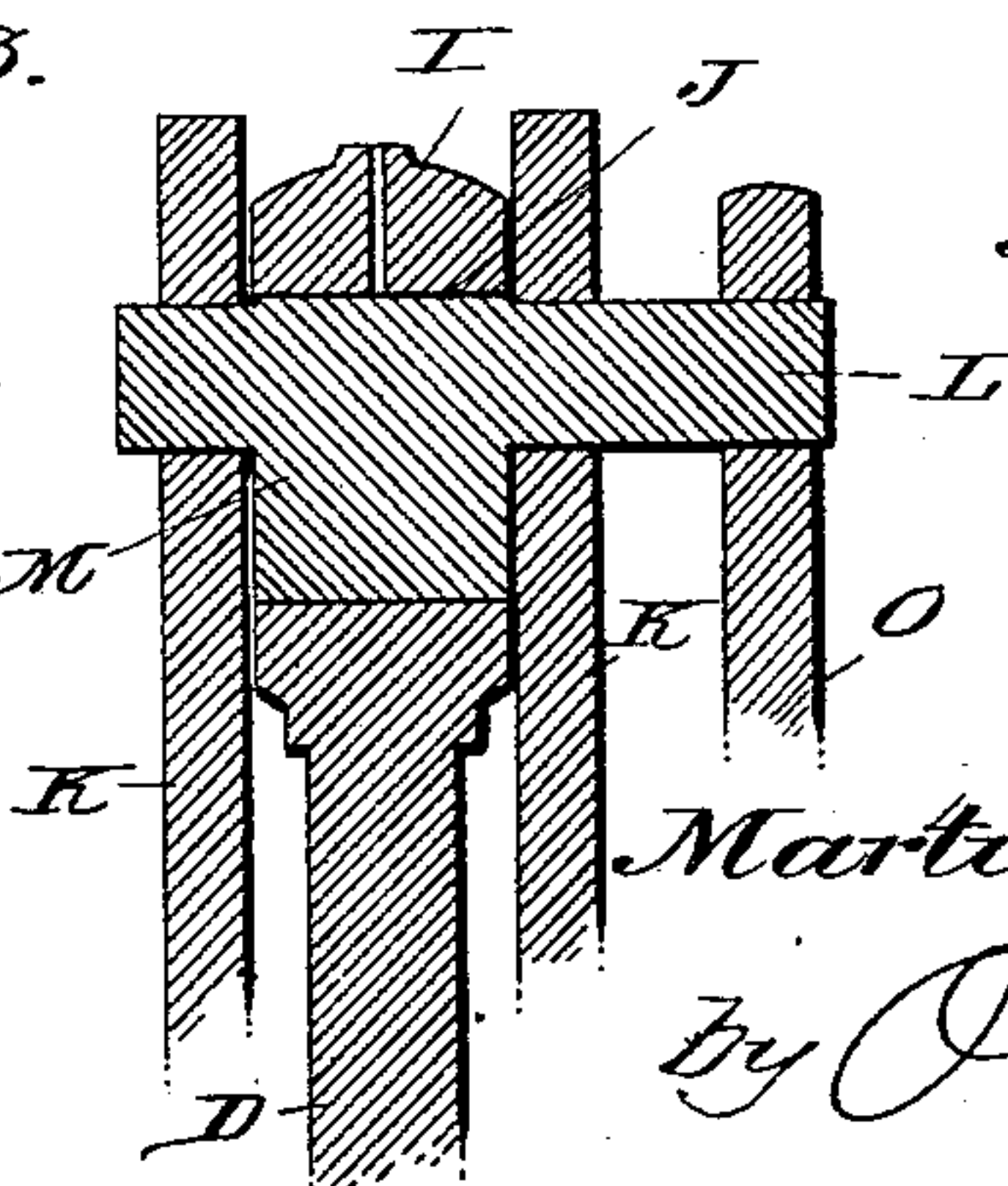


Fig. 4.



Witnesses

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