

(No Model.)

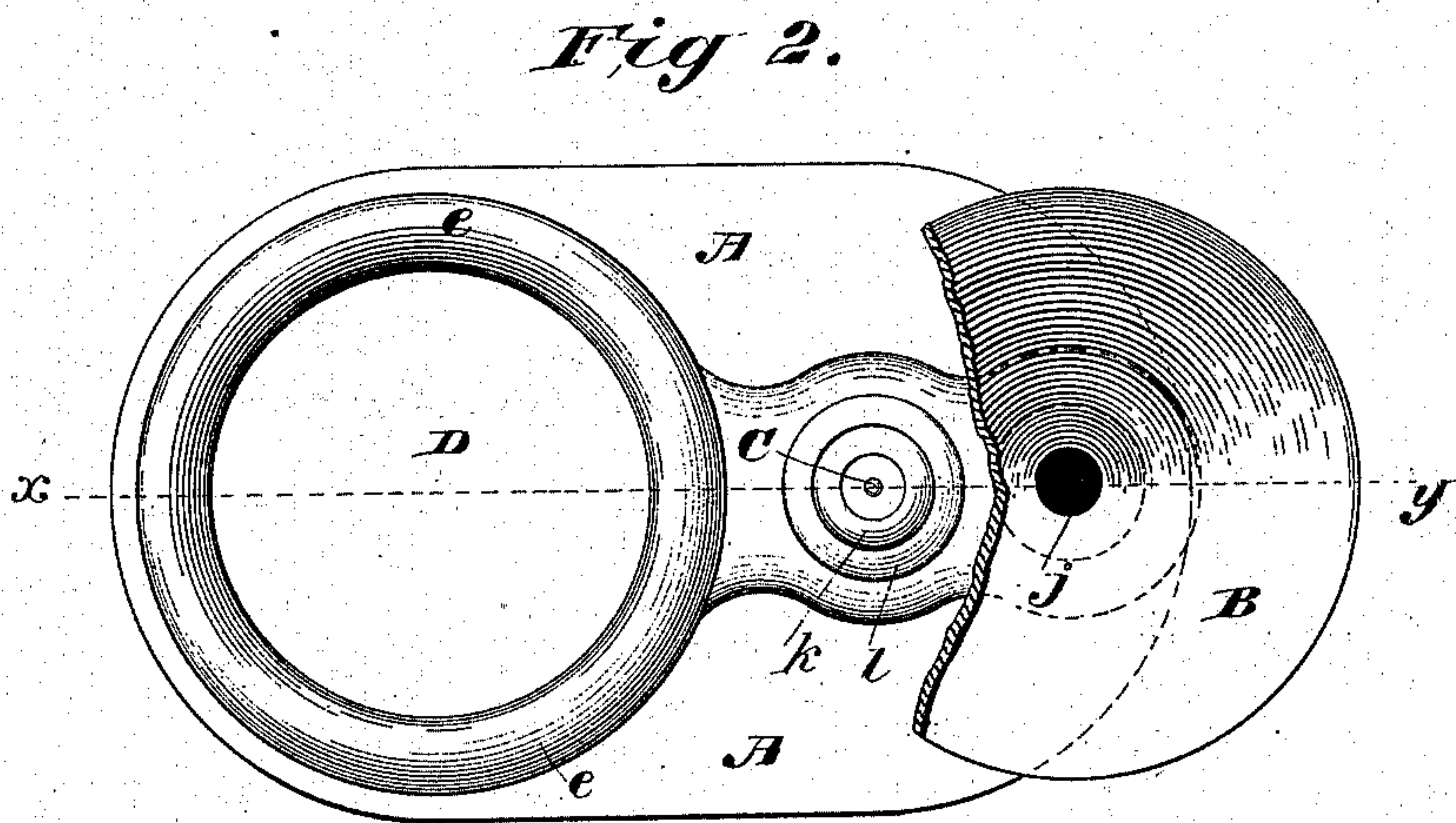
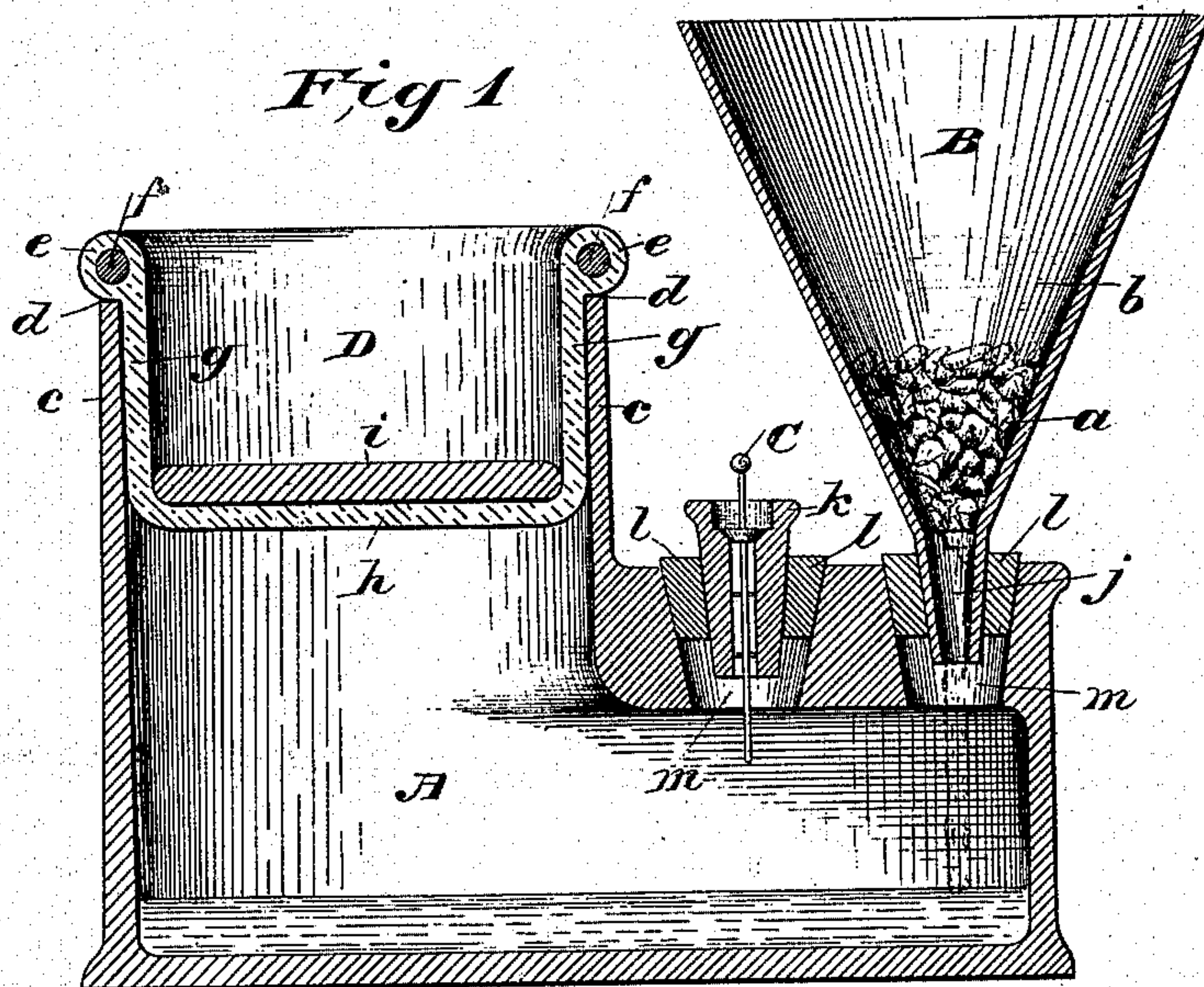
2 Sheets—Sheet 1.

E. W. CARTER & D. R. SMITH.

PERCOLATOR.

No. 288,547.

Patented Nov. 13, 1883.



Attest:
Geo. T. Smallwood.
Rec. Smith.

Inventors
Ezra W. Carter, and
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Fig 3

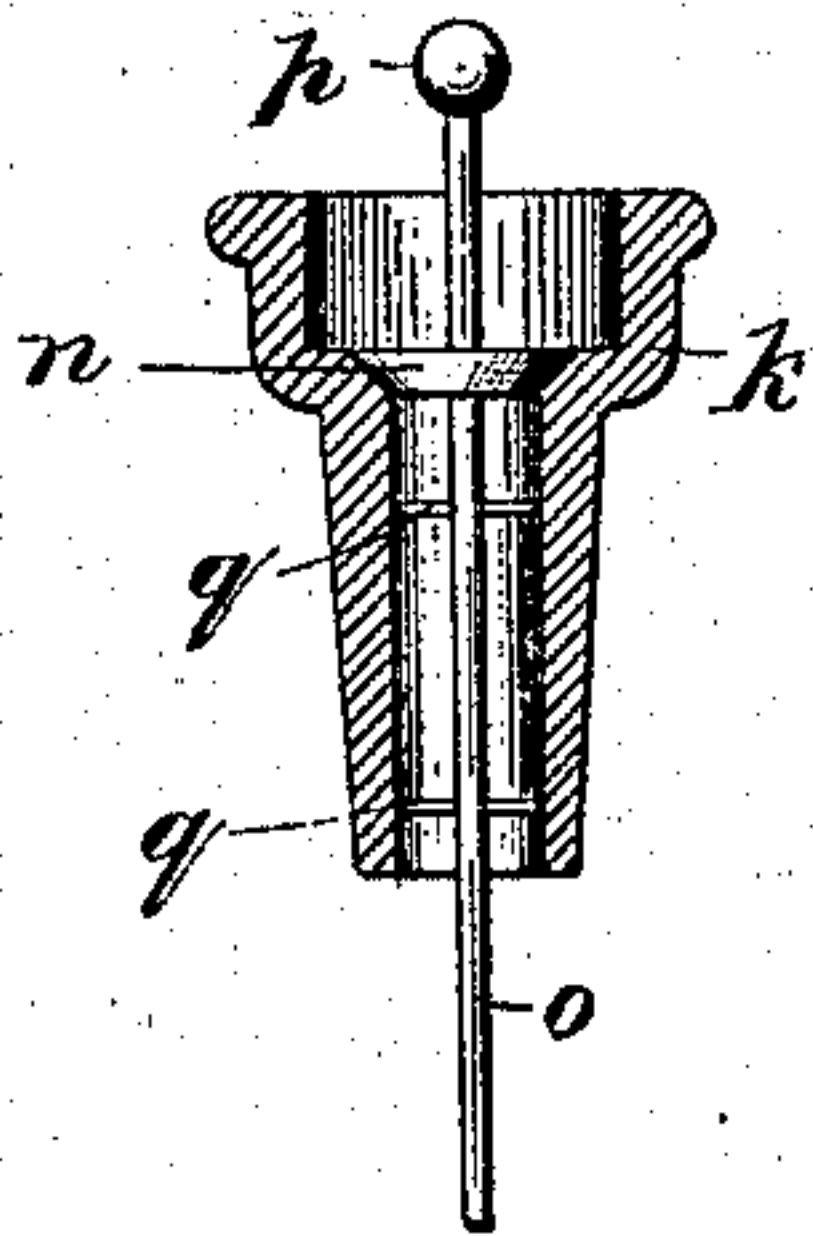


Fig 5.

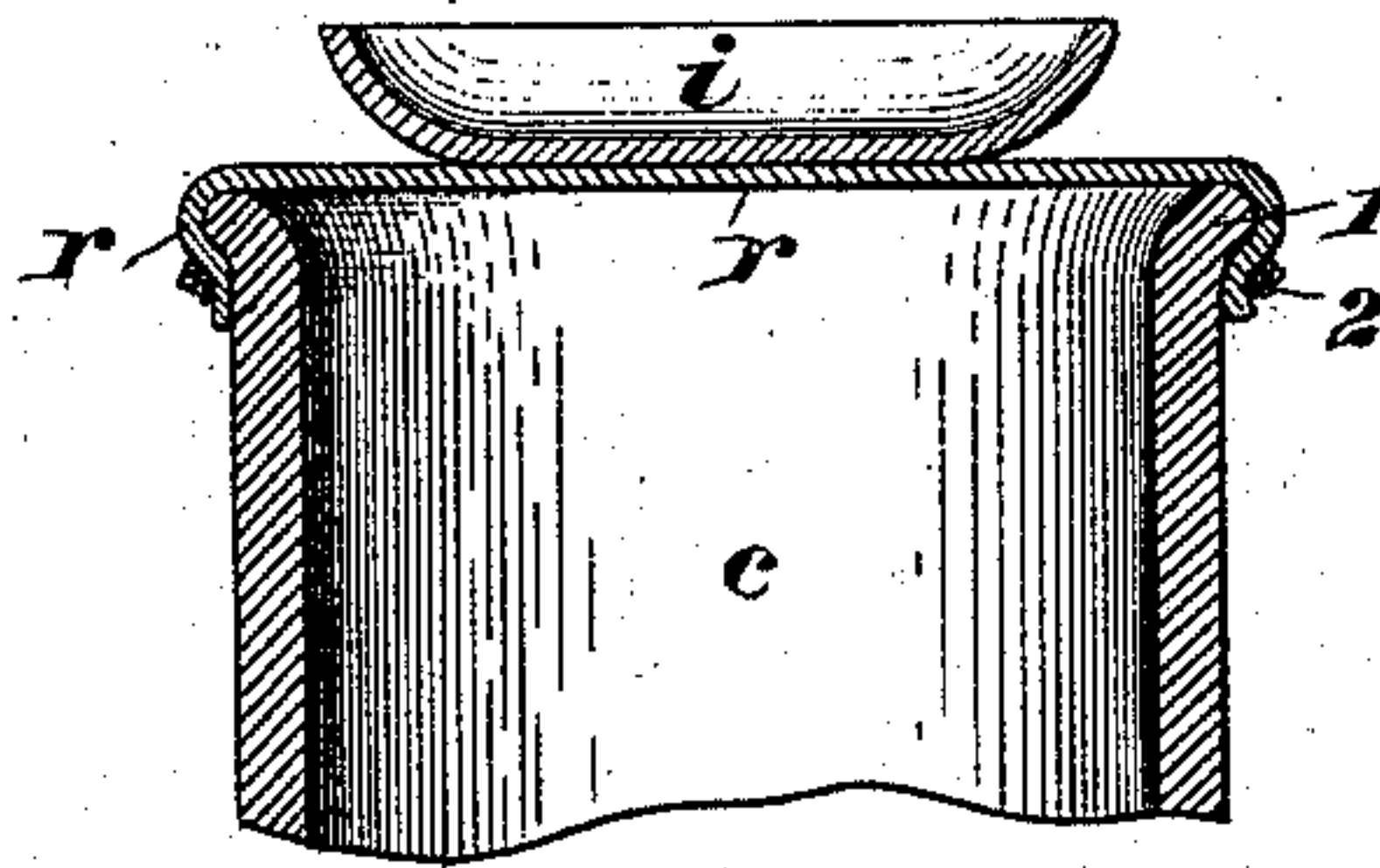


Fig 4.

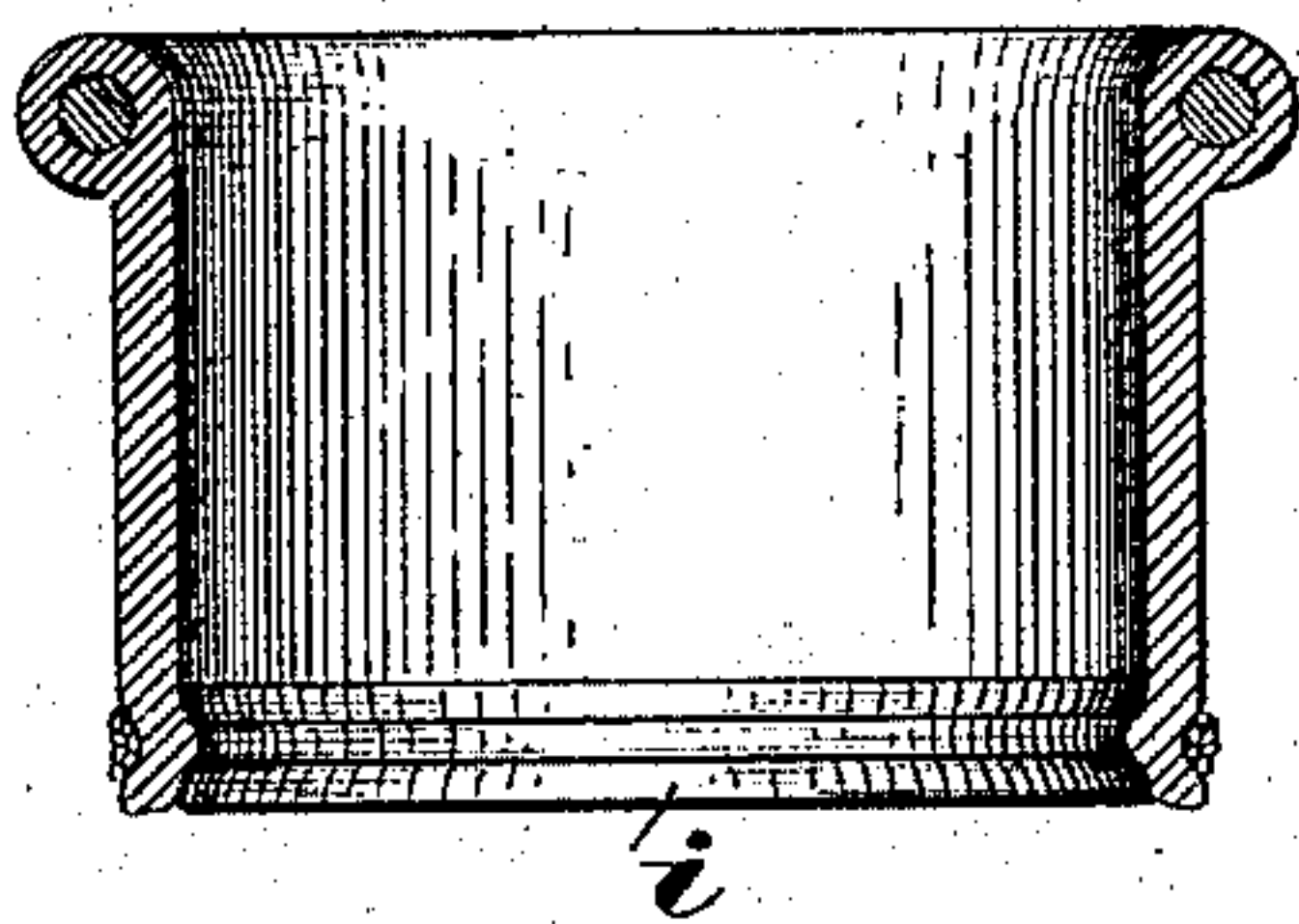
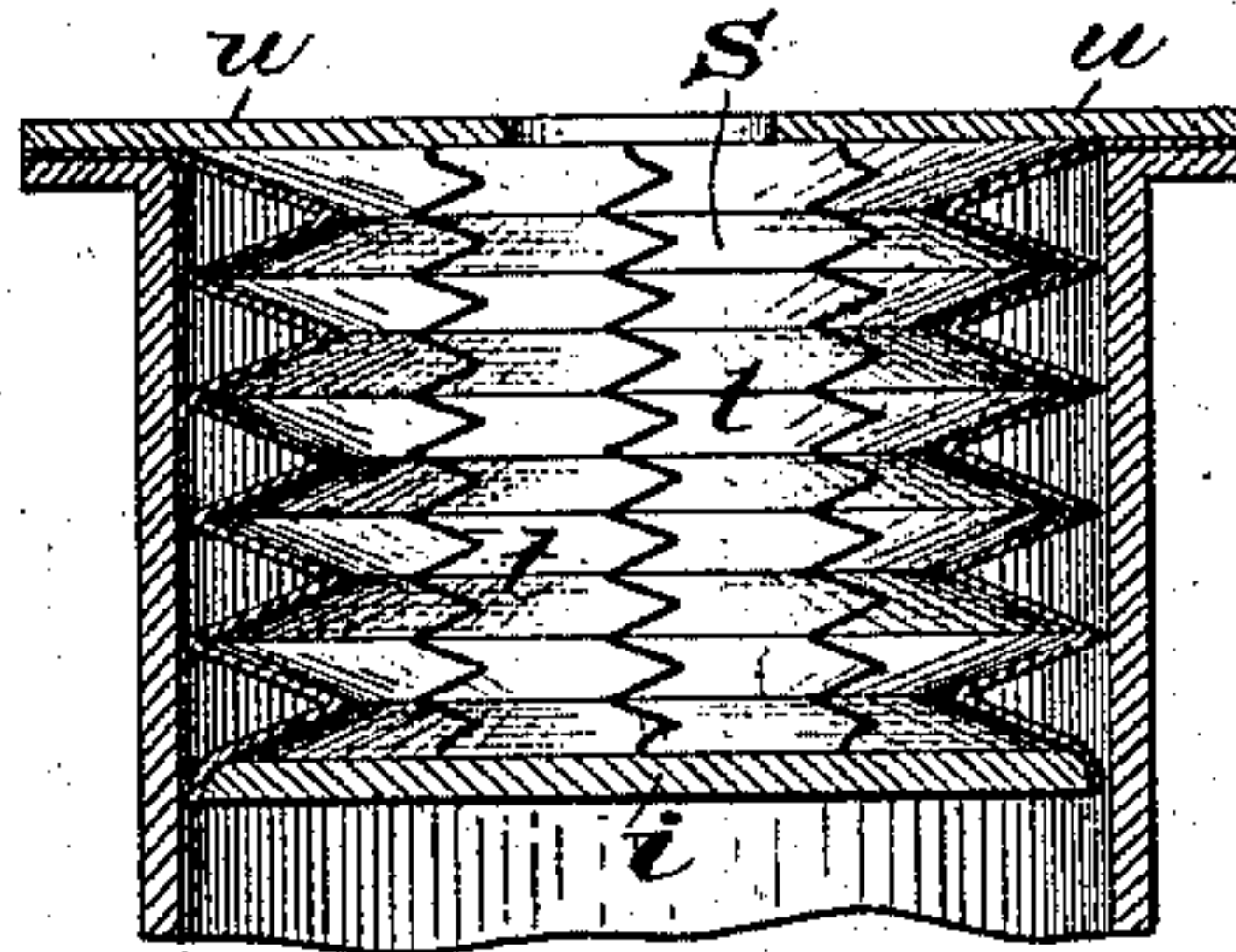


Fig 6.



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UNITED STATES PATENT OFFICE.

EZRA W. CARTER, OF COHOES, AND DAVID R. SMITH, OF GREEN ISLAND,
ASSIGNORS OF ONE-HALF TO RICHARD S. CLARK AND JOHN McCREARY,
BOTH OF COHOES, NEW YORK.

PERCOLATOR.

SPECIFICATION forming part of Letters Patent No. 288,547, dated November 13, 1883.

Application filed June 7, 1883. (No model.)

To all whom it may concern:

Be it known that we, EZRA W. CARTER and DAVID R. SMITH, citizens of the United States, and residents the former of Cohoes and the latter of Green Island, county of Albany, State of New York, have invented a new and useful Improvement in Percolators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

Our invention relates to that class of percolators in which a partial vacuum is maintained in the receiving-chamber, whereby the unbalanced pressure of the surrounding atmosphere is utilized to hasten the passage of the menstruum through the drug.

Hitherto in percolators of this class the required vacuum has been produced by comparatively complicated devices, making the percolators too cumbersome and expensive for general and every-day use.

Our invention consists in the means for producing and maintaining a partial vacuum in the receiving chamber or vessel; and it further consists in the improved percolator in which our invention is embodied.

In the accompanying drawings like parts are indicated by the same numbers or letters of reference.

Figure 1 is a longitudinal vertical section on line *xy* of Fig. 2 of our improved percolator. Fig. 2 is a plan of the receiver. Fig. 3 is a part section and part elevation of our valve. Figs. 4, 5, and 6 represent several modifications in details of construction.

A is the receiving or vacuum chamber or vessel—the receiver. B is the containing-vessel, holding the drug *a* and menstruum *b*. C is the air-valve. D is the exhaustor.

The receiving-vessel must have a suitable opening for receiving the exhaustor, and must have sufficient capacity and a suitable form to permit the necessary expansion and contraction of the exhaustor.

The containing-vessel may have any form suitable for holding the drug and menstruum and discharging the latter into the receiving-chamber or receiver after the percolation has taken place. The air-valve must be so placed

as to be always above the surface of the liquid in the receiving-chamber.

The receiver, the containing-vessel, the air-valve seat or casing, and the valve-stem guides may be all of one piece of glass or other material; or they may be in parts suitably connected together. The air-valve may be of any suitable construction, acting automatically to allow the escape of air from the receiving-chamber, and may be so constructed as to be readily opened by hand when air is to be admitted to the chamber.

The exhaustor consists of an elastic diaphragm or cup secured air-tight to the rim or edges of the opening in the receiving-chamber, and so formed that it may be forcibly expanded within the receiving-chamber, displacing a part of the contained air, which escapes through the air-valve, and so constructed that when the expanding force is removed it will, by the elasticity of its parts, contract or tend to contract to its original magnitude and position, thereby causing the air remaining within the receiving-chamber to expand, forming a partial vacuum.

In the percolator embodying our invention (shown in Figs. 1, 2, and 3) the receiver is provided with a vertical cylindrical tube, *c*, projecting upward, presenting a smooth ring-shaped upper surface, rim, or edge, *d*, upon which an india-rubber ring, *e*, rests, forming, under pressure, an air-tight joint. The rubber ring *e* incloses a metallic ring, *f*. Both of these rings are a part of the exhaustor, which in this instance is cup-shaped, as shown. The ring *f* we make of wire of a size sufficient to give the required stiffness, and of copper wire, in order that, if accidentally bent, it may be restored to its original form without breaking. The exhaustor in this example is a cup, consisting of the following elements, namely: the part *h*, sides *g*, and ring *e*, of india-rubber, in one piece, and the metallic ring *f* and presser-plates *i*, of which cup the presser-plate *i* and part *h* constitute the bottom, and the rings *e* and *f* the ring.

The presser-plate *i*, forming part of the exhaustor, is a circular disk, of wood or metal, resting upon the india-rubber part *h* of the

bottom. The containing-vessel discharges through a conical tubular part, *j*, into the receiver. *k* is the air-valve seat and casing. The part *j* and valve-casing *k* are fitted air-tight to the receiver by means of the taper rubber or cork ring-pieces *l*, which fit into suitable openings, *m*, in the receiver.

The casing *k* of the valve should be, at its lower part, conical or taper in form, and both it and the part *j* may be made to fit air-tight in the openings *m* without any intervening packing.

The containing-vessel may have any suitable form. In the drawings a common funnel is the containing-vessel. *n* is a valve, which, with the stem *o*, guides *q*, and seat *k*, constitute in this example the air-valve C. The knob *p* is for the purpose of opening the valve by hand, to allow air to enter the receiver.

Instead of admitting air when required through the valve C, some other suitable device may be employed for that purpose.

The receiver A should be so proportioned and constructed as to be easily emptied of its contents and cleansed, and should have a broad base, to secure the necessary stability.

In using our invention, the drug *a* being properly packed in the containing-vessel, the menstruum *b* is poured upon it. By the hand, or with the aid of some suitable instrument, the presser-plate *i* is then forced downward, extending the sides *g* and other yielding parts of the rubber, thereby expanding the exhaustor and forcing a part of the air contained in the receiver out through the air-valve. When the hand or instrument is removed from the presser-plate, the elasticity of the rubber will cause the exhaustor to contract until that elasticity is balanced by the pressure of the outer air, thus allowing the remaining air contained in the receiver to expand, causing the partial vacuum required. The pressure of air upon the surface of the menstruum then being greater than that within the receiver, the percolation of the menstruum through the drug is thereby accelerated. If it becomes desirable to interrupt the operation at any stage, air can be admitted by lifting the valve *n* by means of the knob *p*. After the percolation is completed, the exhaustor, the containing-vessel, and the air-valve can be readily removed and the receiver emptied and cleansed.

Instead of constructing the cup in the manner shown in Fig. 1, the cylindrical tube C may be provided with a projecting rim, *l*, as shown in Fig. 5, and an india-rubber tube may be employed to form the cup, with the upper end edges turned over the projecting rim and secured underneath with a tightly-wound cord or wire, 2. The lower end of the rubber tube may be in a similar manner made fast in a groove turned in the presser-plate *i*, as shown in Fig. 4.

A very simple method of constructing the exhaustor D is shown in Fig. 5, in which *r* is a flat circular sheet of india-rubber, the edges of which are turned over and secured under the rim *l* of the tube *c* by a cord or wire, 2, the presser-plate *i* in that figure being formed with a suitable convex under surface, as shown.

Instead of employing india-rubber, the exhaustor may consist of a flexible tube, S, Fig. 6, made of any suitable impervious material, and the contraction of the exhaustor may be secured through the action of spiral-wire springs *t*, secured at their upper ends to an annular cap-plate, *u*, and at their lower ends to the presser-plate *i*.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The receiver A, in combination with the exhaustor D, consisting of an elastic diaphragm secured to the rim or edges of an opening in the receiver or vacuum-chamber, a presser-plate substantially of the form shown and for the purpose described, an automatic air-valve for permitting the escape of air from the receiver, and means, also, for allowing the material in the containing-vessel to enter the receiver, substantially as described.

2. In a percolator, the combination of the following parts, viz: the exhaustor D, receiver A, air-valve C, and containing-vessel B, all arranged for the purpose and substantially as described.

3. The combination herein described of an exhaustor, D, with a receiver, A, provided with a containing-vessel, B, and an air-valve, C, the stem *o* of which projects upward or outward, and carries a suitable knob, *p*, by which the valve may be opened and air admitted to the receiver.

4. The percolator herein described, consisting of the receiver A, exhaustor D, and valve C, projecting stem *o*, and knob *p*, containing-vessel B, the several parts constructed, combined, and arranged in a manner substantially as herein set forth.

5. The percolator herein described, consisting of the receiver A, exhaustor D, air-valve C, projecting stem *o*, and knob *p*, containing-vessel B, and ring-pieces *l*, the several parts constructed, combined, and arranged in a manner substantially as herein described.

In testimony whereof we have hereunto set our hands this 15th day of May, A. D. 1883.

EZRA W. CARTER.
DAVID R. SMITH.

Witnesses:

CHAS. E. LAWSING,
WM. J. ELLIOT.