

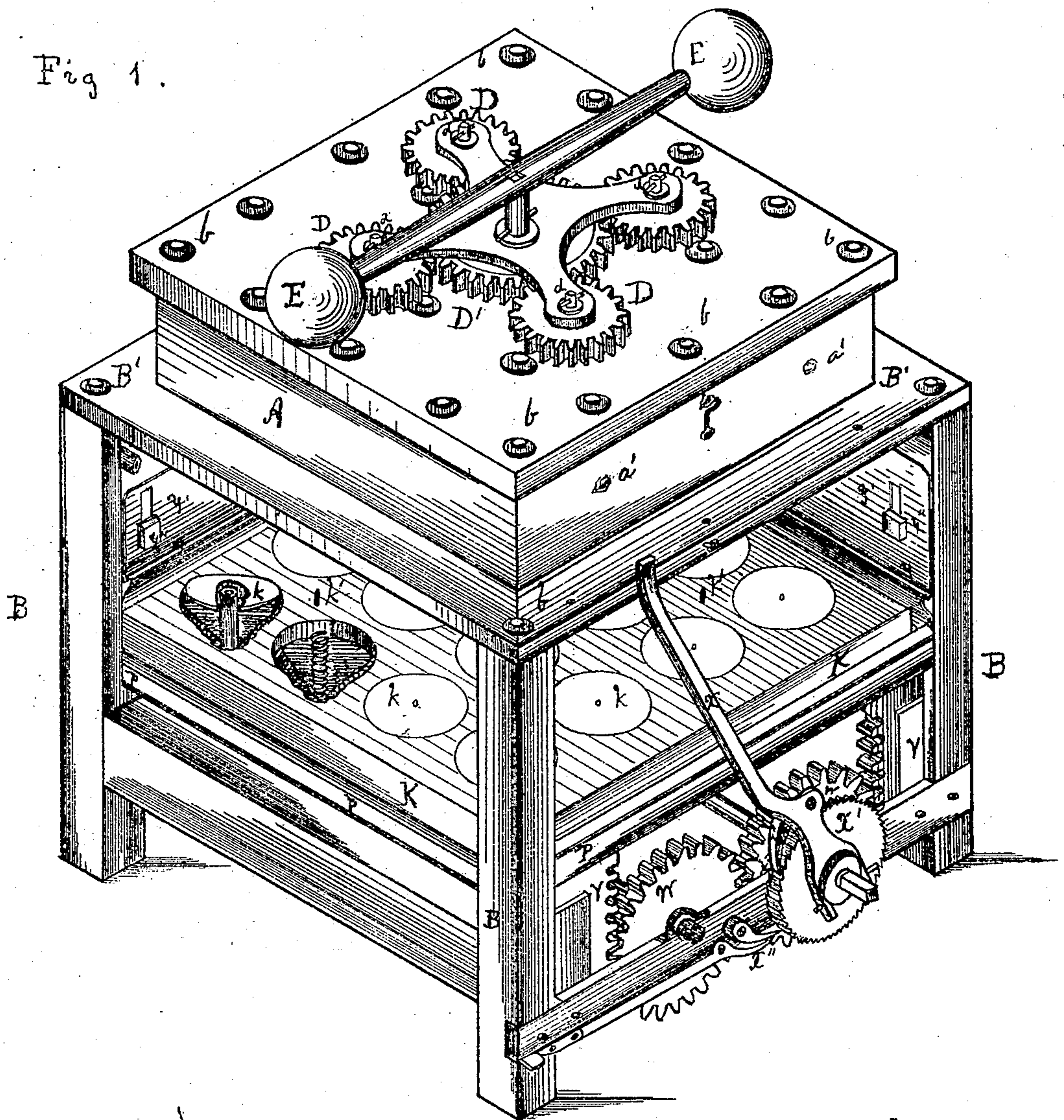
N. H. SHIPLEY.

Improvement in Process for Canning and Preserving Fruit, etc.

No. 123,366.

Patented Feb. 6, 1872.

Fig 1.



Witnesses
Oathman & Ellsworth
Chas. Rawlings.

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N. H. Shipley.
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N. H. SHIPLEY.

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Fig 6

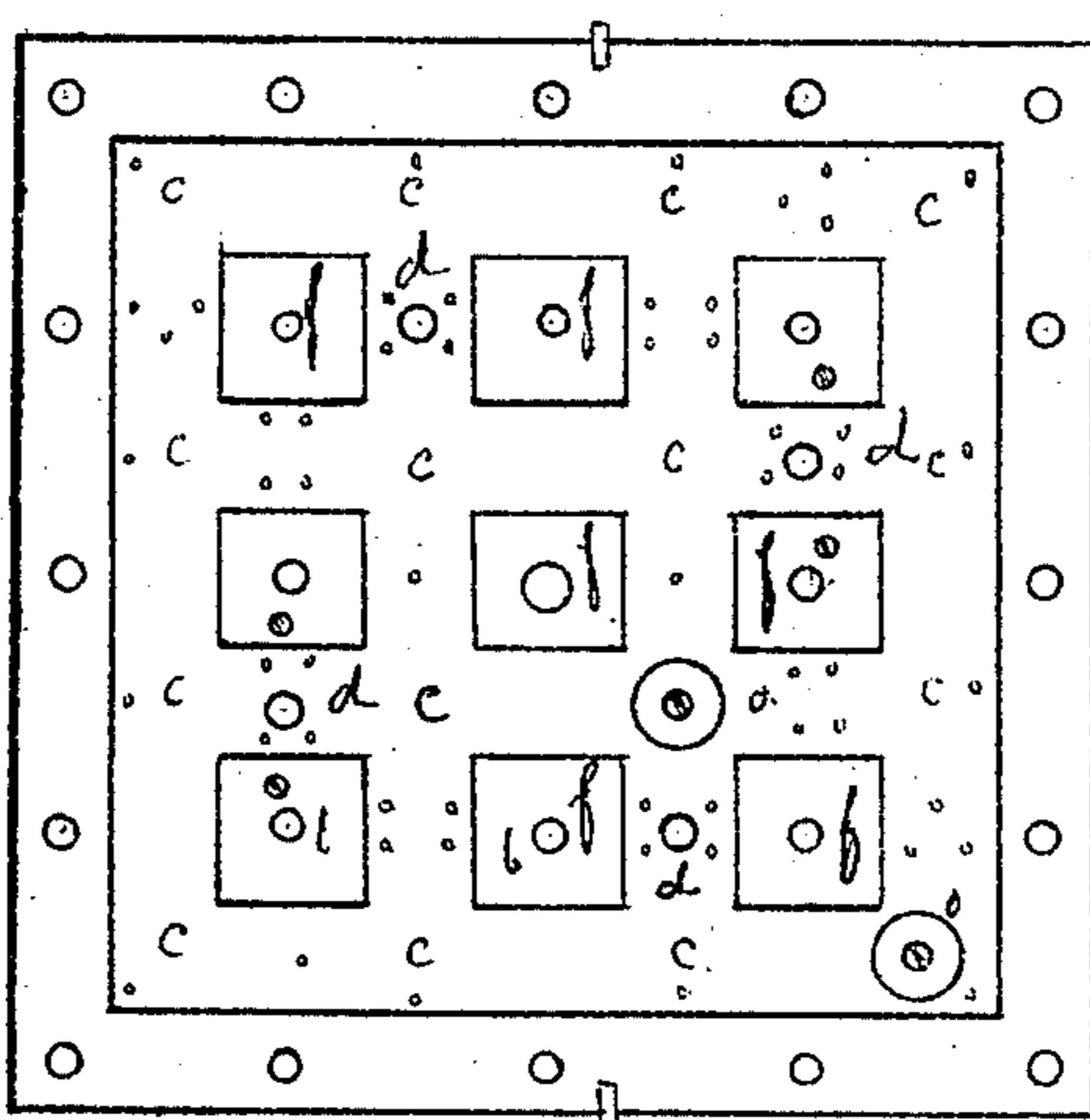


Fig 9

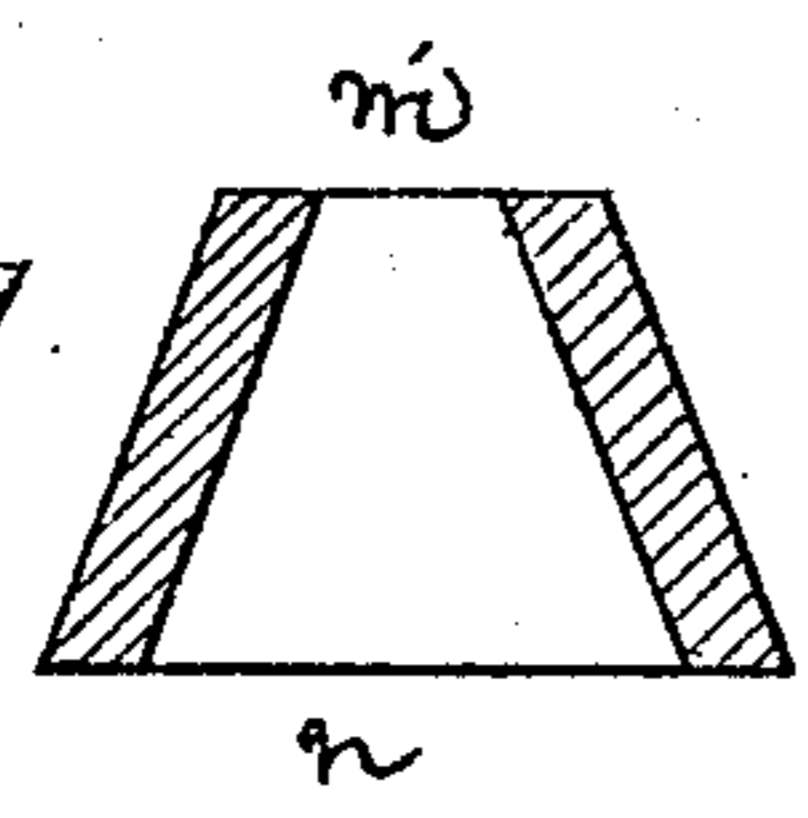


Fig 7

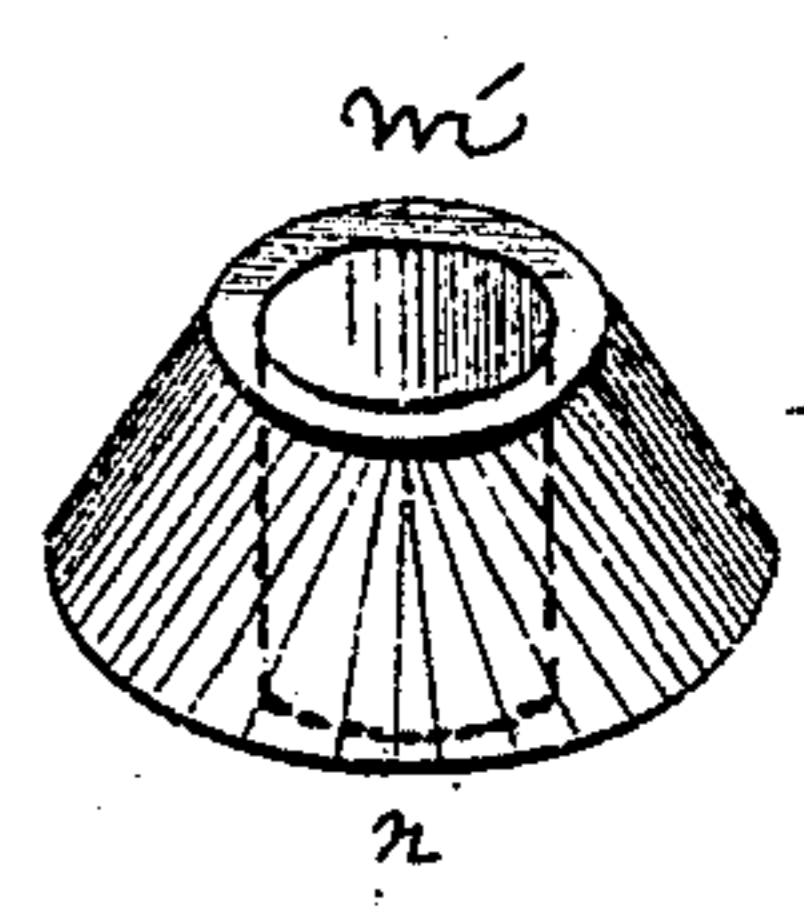
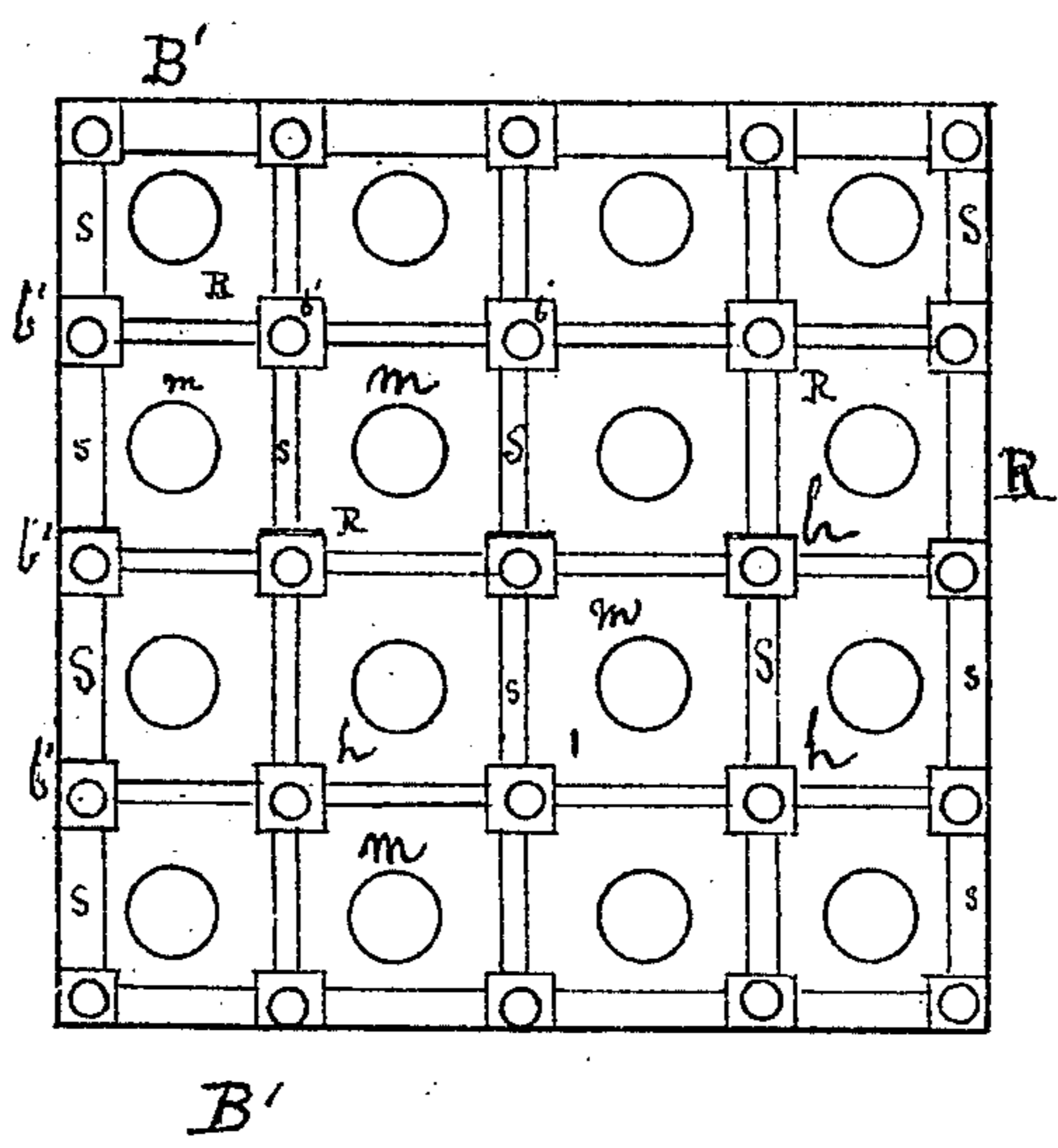
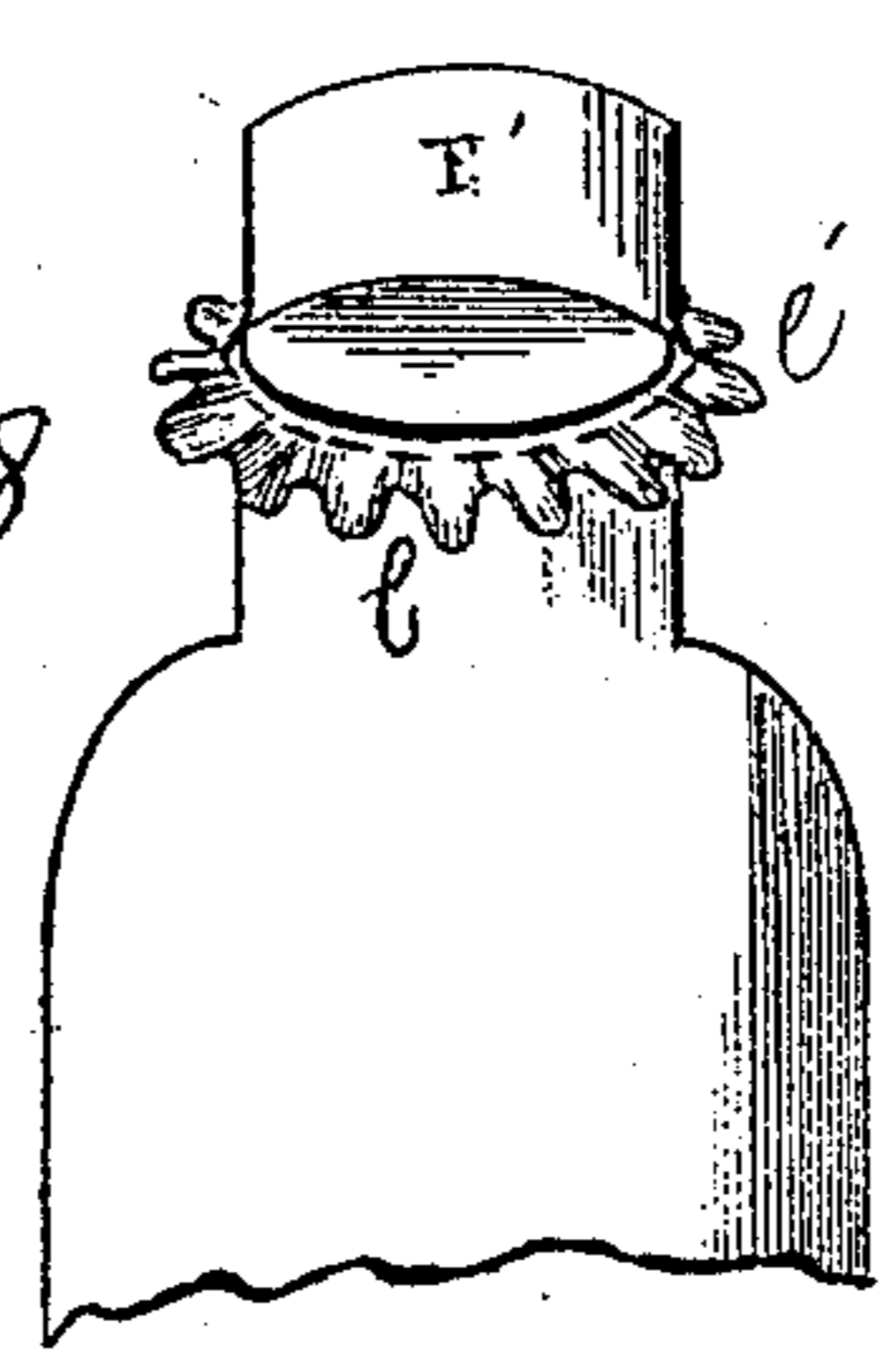


Fig 10

Fig 8



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Fig 2.

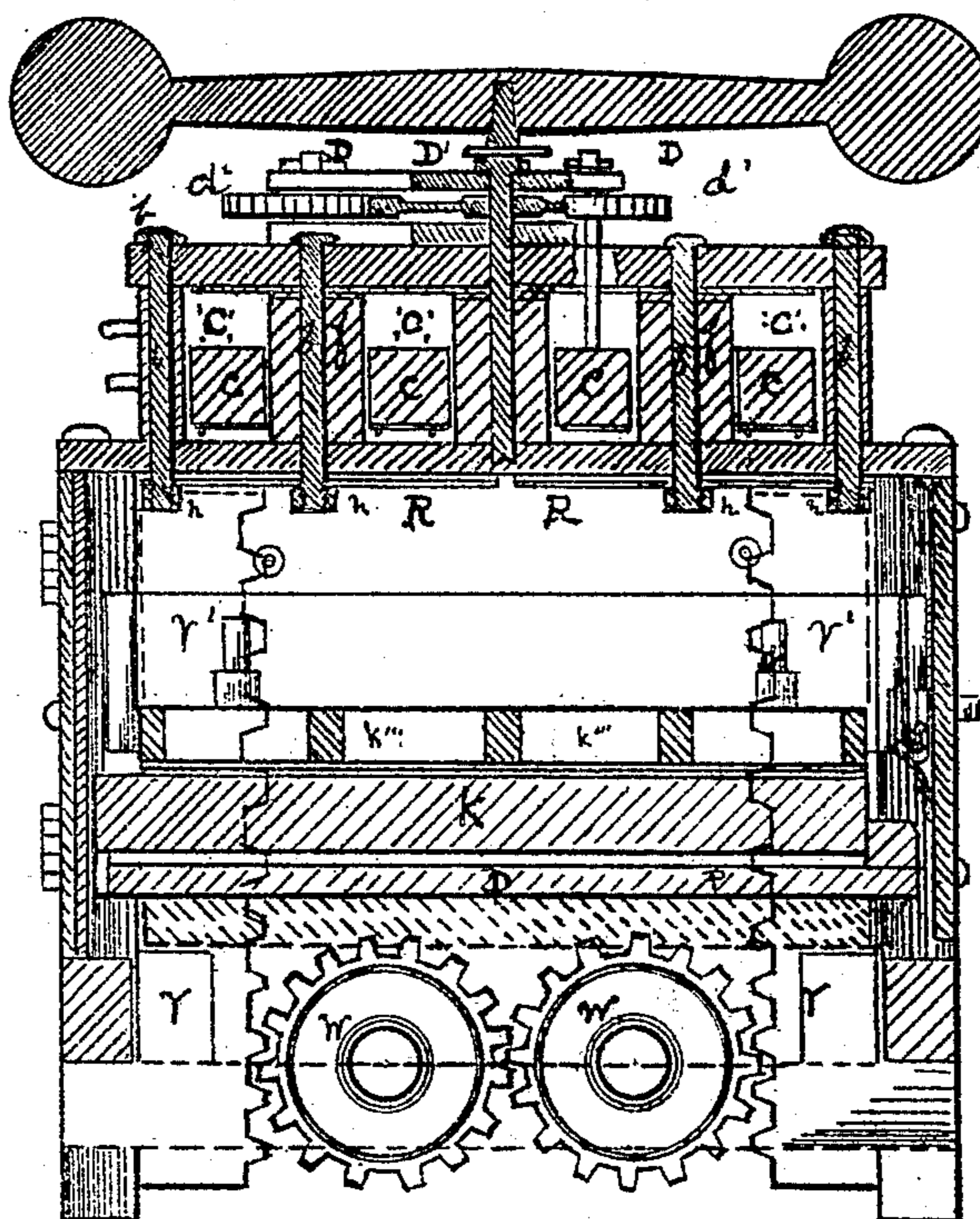


Fig 4.

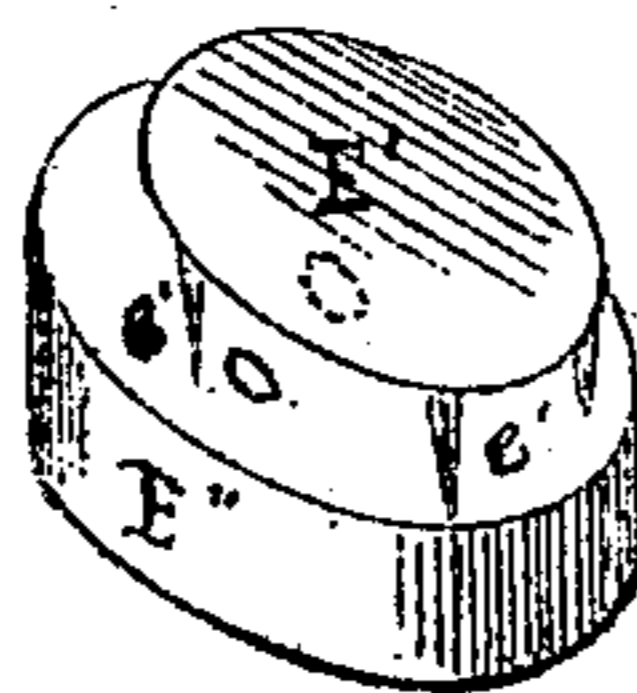


Fig 3.

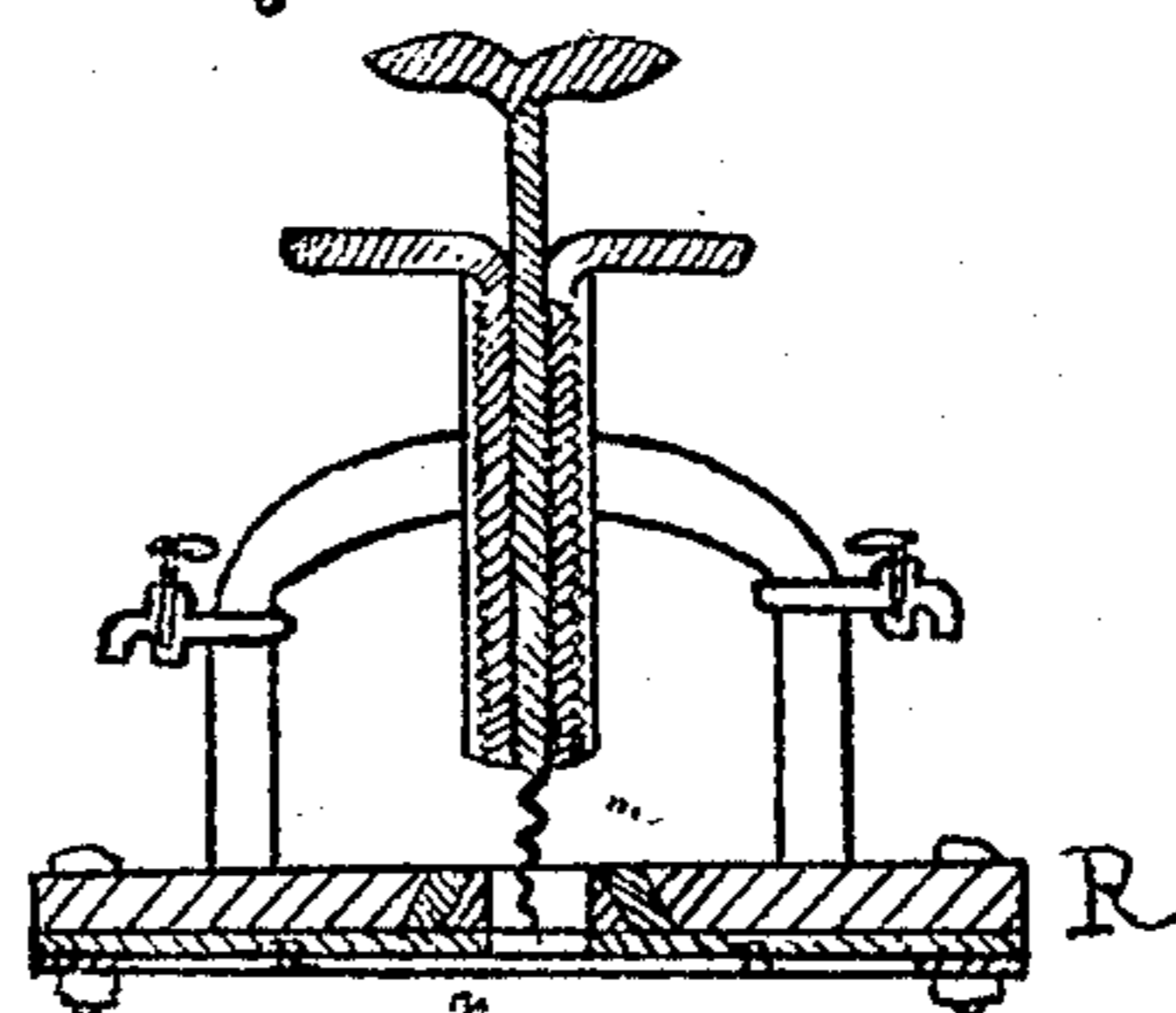
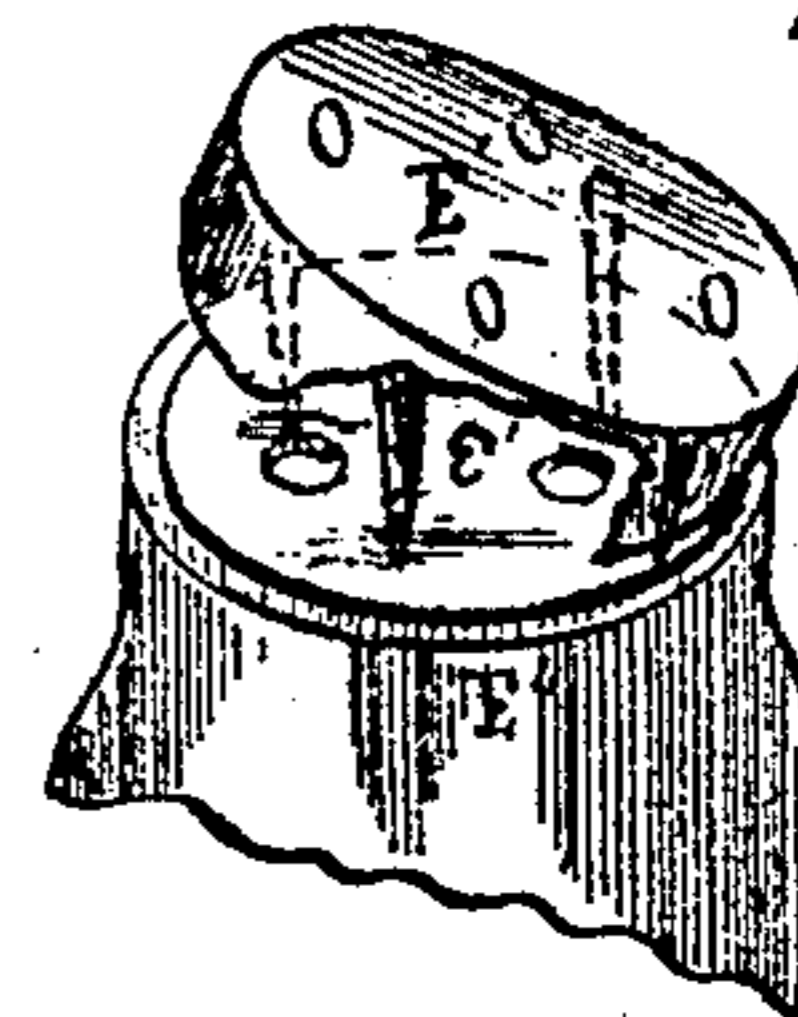


Fig 5.



UNITED STATES PATENT OFFICE.

NICHOLAS H. SHIPLEY, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN PROCESSES AND APPARATUS FOR CANNING AND PRESERVING MEAT, &c.

Specification forming part of Letters Patent No. 123,366, dated February 6, 1872.

To all whom it may concern:

Be it known that I, NICHOLAS H. SHIPLEY, of the city and county of Baltimore, in the State of Maryland, have invented an Improvement in Apparatus and Process for Canning and Preserving Meat, Fruits, Vegetables, &c.; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a perspective view of the machine. Fig. 2 is a vertical section of the same. Fig. 3 is a vertical section representing a form of apparatus designed for exhausting the air from a single vessel, but which may be so constructed as to be applicable to any number of vessels simultaneously. Figs. 4 and 5 are perspective views representing the manner in which wide-mouthed jars or cans are closed and kept tight before sealing. Fig. 6 is a plan of the under side of the movable plate or system of cross-bars. Fig. 7 is a plan of the under surface of the plate. Fig. 8 is a perspective view, showing my improved method of packing the necks of the cans below their openings made for exhaustion. Fig. 9 is a vertical section of one of the conical rings employed to reduce the size of the openings in the plate; and Fig. 10 is a perspective view of another ring, having a conical form with a cylindrical aperture, for the purpose not only of reducing the size, but also of changing the shape of said openings.

Similar letters of reference in the accompanying drawing indicate corresponding parts.

The object of my invention, which is an improvement upon those patented by me January 24, 1871, No. 111,264, and March 14, 1871, No. 112,642, is to provide an improved apparatus for readily and easily exhausting atmospheric air from any number of vessels simultaneously, with means at the same time of applying heat or cold to them at pleasure while *in vacuo*, and of closing the vessels efficiently at one time at any stage of the process for purposes of scientific experiments, and for domestic use in preserving meats, fruits, vegetables, &c., and to that end it is adapted no less to the use of the consumer and producer than the merchant and manufacturer. The apparatus is designed also to substitute gases or liquids for atmospheric air thus exhausted from vessels; and pertains moreover to certain other

novel features and arrangement of parts, and to novel processes, as hereinafter described. To this end the machine consists: First, of a peculiarly-constructed plate and receiver of an air-pump, against or through the perforated plate of which are pressed or passed from beneath the mouths or necks of the vessels containing the substances to be subjected to its action, which vessels are specially constructed for that purpose, and which are intended to be exhausted simultaneously with the receiver. The receiver contains a mechanism for closing the vessels thus entering it or applied to its plate while *in vacuo*, and is constructed very carefully with a view to resistance to outward or inward pressure, by reason of exhaustion or condensation, as well as to economy of the space inclosed, so as to constitute it as near as may be a mere channel for the exhaustion of these vessels or secondary receivers. Secondly, a frame of sufficient strength and dimensions to sustain the plate and the receiver, which are to cover it, to contain and support the vessels and the machinery by which it is designed to apply them, and to supply by its outer walls a sealed chamber for the purpose of inclosing the bodies of the vessels, so that they may be conveniently subjected to other processes. Thirdly, of one or more frames, drawers, or carriages for conveying the vessels to the apparatus and applying them to and securing them to the openings prepared for them, and removing them therefrom when exhausted and supplying their place with others with dispatch. Fourthly, of the vessels themselves and their stoppers.

In the accompanying drawing, B B is a rectangular frame covered by the plate B' and the receiver A, which are firmly attached together and to the frame by means of the screw-bolts *b b*. Within the receiver is a movable horizontal plate with convenient openings or systems of cross-bars *c c c*, capable of being depressed or elevated by means of a series of screws, *d d d*, entering it through the top of the receiver, to the stems of which are fixed the pinions D, working into a central driving cog-wheel, D', upon the shaft of which is placed the lever E, by which a uniform motion is imparted to the screws *d d*, and the perforated plate or system of bars, by means of the screws acting near its outer bearings, is forced to move

with an even pressure upon the plate B' or the stoppers. In the open spaces between the cross-bars or perforated plate for that purpose, and extended between the plate B' and receiver A, are erected the guides or standards *f f*, through which the plate and receiver are still further braced and held together by means of the screw-rods *b b* passing through them and secured by taps *h h* on the under side of the plate B'. These standards answer also the further purpose of filling space, and thereby lessening the amount of space to be exhausted. All the joints of this part of the apparatus may be securely packed in the usual manner and lubricated properly at pleasure; but it is proper to call particular attention to the novel packing of the openings in the plate destined to receive the necks of the vessels. These apertures, *m m*, are conical, having their bases *m* on the under side of the plate, while their openings on the upper surface should nearly fill the space lying between the standards *f f f*. The plate, thus braced and strengthened, it is apparent may be reduced to any desirable thickness with security—a matter of some importance in view of the varying dimensions of the necks of the flasks of the vessels used, and of the fact that it may often be desirable to apply the rims of the vessels only to the bottom of the plate and close them through its aperture. For this purpose stoppers *o* to fit the openings in the plate are made, to be attached at pleasure to the movable cross-bars within the receiver and close the vessel beneath it. For these apertures in the plate is also prepared a number of rings, *m' m'*, fitting into them, by which their size or shape may be changed at pleasure. For packing I apply a suitable sheet of rubber, *R*, to the under side of the plate and secure it thereto by means of narrow frames *s s* abraded on the under side, which are themselves held in their places and upon the rubber by the bolts *b b* and taps *b' b'*, which bolts pass through the receiver and plate. These sheets of rubber—a separate one being provided for each aperture—have themselves a circular opening of smaller dimensions opposite the apertures *m m*, and being firmly held at their outer edges by the aforesaid metallic abraded rims, the elasticity of the intermediate part being left unconfined, the sheet is free to enter the conical apertures upon any upward pressure and to form a sufficient packing therein, while it has at the same time the additional advantage of withdrawing and freeing the aperture when the pressure is removed. These sheets of rubber, it is apparent, may be applied or removed with great convenience, while, by substituting different sheets, varying in their thickness and in the size of their openings, they are made capable of accommodating the plate to vessels of a variety of size and forms. It is important in presenting the vessels to the plate that they should reach it at the same time and enter it by uniform pressure. To effect this they are thrown up by the platform P by means of a combination of machinery acted

upon by a single force, having equal bearings, as near as may be, on the whole platform at the same time. In view of this the platform P is supported on four toothed racks, *v v*, near its outer bearings, which are geared into two pairs of cog-wheels, *w w*, on either side of the machine, which are also geared into each other and connected together by shafts running through the frame, and moved together on either or both sides by means of a lever, *x*, connected with a ratchet-wheel, *x'*, provided with suitable pawls, *x''*, and their appendages for sustaining the load at any desirable point of elevation, and facilitating its detachment and descent when required. It is plain the plate and receiver may be made removable within the frame of the machine, and these racks *v' v'* extended to support, elevate, and depress it upon the vessels, if preferred; but to further secure the accuracy of this movement of the platform it is made to pass freely within the frame to avoid friction against its sides, and is for that purpose chamfered on its upper edge. It being desirable to form a sealed chamber to contain the bodies of the vessels when they have been applied to the plate, these chamfered edges are met at the proper lines by the elastic cushions *y*, of rubber or similar material, attached to frames *y' y'*, which are held against the inner walls of the apparatus by means of hand-bolts *y'' y''* passing through slots in the metallic frame and through holes in the walls of the machine, by which they are readily adjustable to meet the chamfered edges of the platform at any desirable point of elevation and close the chamber, as required. It is evident that the doors may be closed in like manner by a similar cushion permanently attached to them or the front edge of the platform. Upon this platform is placed the drawer or carriage K containing the vessels, which, still further to assure a direct and even contact with the plate, I provide with a series of springs K, of rubber or wire, properly inclosed and confined, to furnish a separate seat for each vessel, thereby reciprocating the action of the packing under the plate, and compensating still further for any slight irregularity in the action of machinery or in the size or position of the vessel. For this carriage is also provided any number of light frames of deal *k''' k'''*, adapted to vessels of various sizes, for the purpose of still further securing them in their places and guiding them in their true directions. They are held in their places by dowel-pins *k'*.

The vessels themselves and their stoppers require some peculiarity of construction to adapt them to the machine. These vessels may be made of any of the usual materials—sheet metal, glass, or earthen-ware—and need differ little in form from such vessels in common use. But as it is designed to place their stoppers or caps in or upon their mouths before they are introduced into the machine, a provision is made for the escape of air or vapor while they are in this position. For this purpose, where an elastic stopper of cork or rubber is used,

one or more slits or openings are made therein, which leave a sufficient opening for ventilation where the stopper is pressed in slightly by hand, but capable of being perfectly closed when they are driven home by any sufficient pressure. The same result is obtained in vessels of sheet metal by perforating their caps or necks and closing them in like manner. In this case the caps may be lined with rubber or with glutinous matter to secure them until they are properly soldered.

Again, as a means of securing metallic vessels, I throw around their necks a ring of very thin rubber, *l*, which, grasping them tightly by the inner circle while the sheet will hang about them in the manner of a frill, *l'*, is, upon the depression of the cap, spun into an elastic thread, and thus seals the vessel hermetically. But when it is desirable to use vessels with very short necks, or such as have a rim only about their mouths, and which may be pressed by means of these rims against the bottom of a plate, I make use of the following device: I stop the vessel with cork or rubber (*E'' E''*) in the usual manner after it has been filled; I then, as previously, perforate the stopper with any number of openings sufficient for ventilation; I then provide caps or plates *E' E'* as coverings, which are also perforated, and furnish them with any number of pins, *e e*, bearded or otherwise, which are securely fastened to them. This device—viz., *E E'*—is to be forced upon the stopper after ventilation. It is plain when they are driven home the vessels are effectually closed, and the pins have served not only as guides and supports, but as a means of further securing the attachment of the parts.

As thus constructed the operation of the machine and its appendages is as follows, viz.: The flasks or vessels, having been supplied with the substances to be preserved and their stoppers or caps firmly adjusted, are placed upon the drawers or carriages *K*, regulated by their guides *k''*, and the carriage introduced into the machine upon the platform *P* provided for it. This platform is then elevated by means of the lever *X*, and the vessels thereby pressed to a perfect contact with the packed apertures of the plate, and the chamber containing the vessels afterward closed. An air-pump is then connected with the receiver *A* by means of a stop-cock, *a'*, and the air within the receiver and vessels exhausted as far as possible under the circumstances. While in this stage of exhaustion a jet of steam is let into the sealed chamber containing the bodies of the vessels by means of an opening provided therefor. Under the diminished atmospheric pressure thus produced an ebullition of the contents of the vessels is effected, whereby such air as may still permeate the substances they contain is thrown up into the receiver, accompanied by any vapor which may be at the same time thrown off. The pump is thereby rendered again capable of working and a still more perfect exhaustion effected, the atmosphere hav-

ing been not only withdrawn from the surrounding space, but expelled in a manner from the substances themselves. The steam which has been applied may be now suffered to escape by an opening prepared for that purpose, and a gas from an elastic gas-holder suffered to enter the receiver at the cock *a''*, while at the same time a spray of cold water may be applied to the bodies of the flasks, whereby the gas already entering them under the full force of atmospheric pressure is still further condensed, and caused to permeate the substances contained in the vessels in consequence of the contraction and shrinkage of their parts produced by the action of the cold. But it is plain, in view of the vessels or secondary receivers lying beneath the plate, a liquid as well as a gas may be suffered to enter by means of an elastic holder and fill the exhausted spaces within them by the force of its gravity. It is plain that this liquid in passing through the exhausted medium of the receiver, which may be still kept under the action of the pump, is therein filtered and sifted of the gaseous matter it may contain; and, if this liquid be the substance designed to be preserved, this filtration will at least remove from it any corrupting influence of atmospheric air. But I introduce a liquid for other purposes also—viz., for preserving the substances which they may surround. Thus sifted of its corrupting particles, it becomes a wall of protection for the substances it may embrace.

We will now describe the operation of the machine for scientific purposes. In that view we regard it as an inversion of the familiar philosophical apparatus, the air-pump and its appendages; for, in effect, its receivers are thrown beneath the plate, and what we have technically called a receiver is but, in fact, an expansion of the air-passage of an air-pump provided with a mechanism similar to the ordinary stop-cock pertaining to that apparatus, but with the advantages of transmitting its seal to any number of receivers applied to the plate.

It follows that any number of receivers may be subjected to the action of one pump at the same time; that their connection with each other may be broken or restored at pleasure; and that thereby observations may be compared with facility and scientific specimens preserved in the most effectual manner.

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

1. I claim the combination of the posts *f f* with the receiver and the movable plate or system of bars *c c*, substantially as and for the purposes set forth.

2. I claim the bolts *b b*, in combination with the posts *f f*, the receiver *A*, and the movable plate or system of cross-bars *c c* and the plate *B'*, substantially as and for the purpose described.

3. I claim the combination of the independent screw-shafts *d d* and the central operating

shaft or wheel D', operating with each other and with the movable plate or cross-bars *c c* and the receiver A, substantially as and for the purpose described.

4. I claim the combination of the flat rubber sheets R R, having circular apertures, with the plate B', the frame *s s*, and screws *b b*, substantially as and for the purpose described.

5. I claim the independent rings *m m*, in combination with the conical holes in the plate B' and the rubber packing R R, substantially as and for the purpose described.

6. I claim the movable plate, drawer, or carriage K, provided with independent adjustable supports *k* for each bottle or can, substantially as and for the purpose described.

7. I claim the elastic cushion *y* and its supporting apparatus *y' y'*, constructed as described, and applied to the box or frame B, in

the manner and for the purpose herein specified.

8. I claim the lever, ratchet, pawl, and gears, in combination with the racks *v v* and the platform-carriage plate or drawer K, constructed and operating substantially as and for the purpose herein set forth.

9. I claim the means *e e'* for closing the bottles or cans preparatory to sealing, substantially as shown in Figs. 4 and 5, and as herein described,

10. I claim the frill or circle of rubber *v'*, in combination with the vessel or cap, as shown in Fig. 8, and as herein described.

NICH S. H. SHIPLEY.

Witnesses:

NATHAN K. ELLSWORTH,
A. C. RAWLINGS.