

A. MOUNEYRAT.
ANAEROBIC CHAMBER.
APPLICATION FILED OCT. 28, 1918.

1,331,207.

Patented Feb. 17, 1920.

2 SHEETS—SHEET 1.

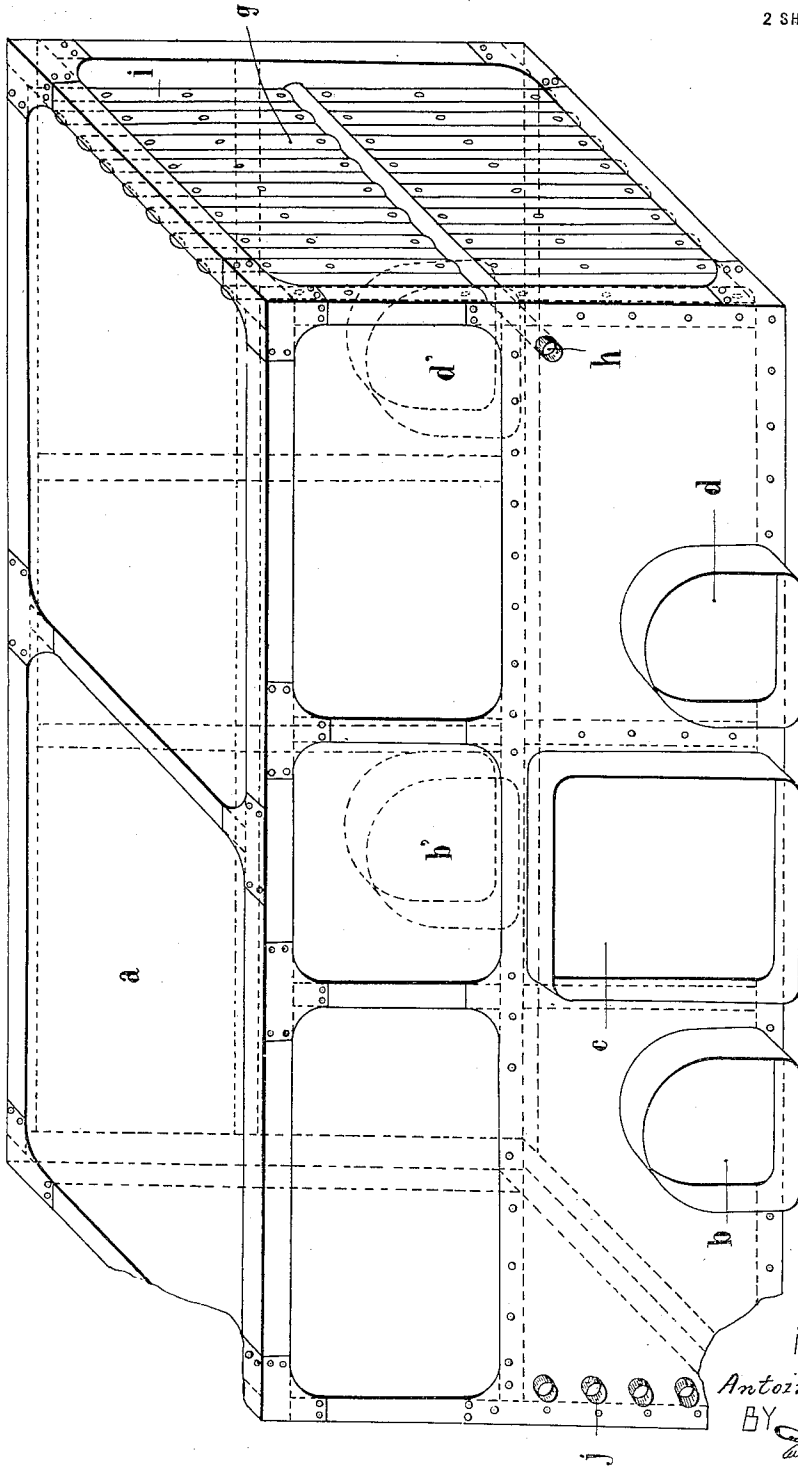


Fig. 1.

INVENTOR
Antoine Mouneyrat
BY *Louis Marinelly*
ATTORNEY

1,331,207.

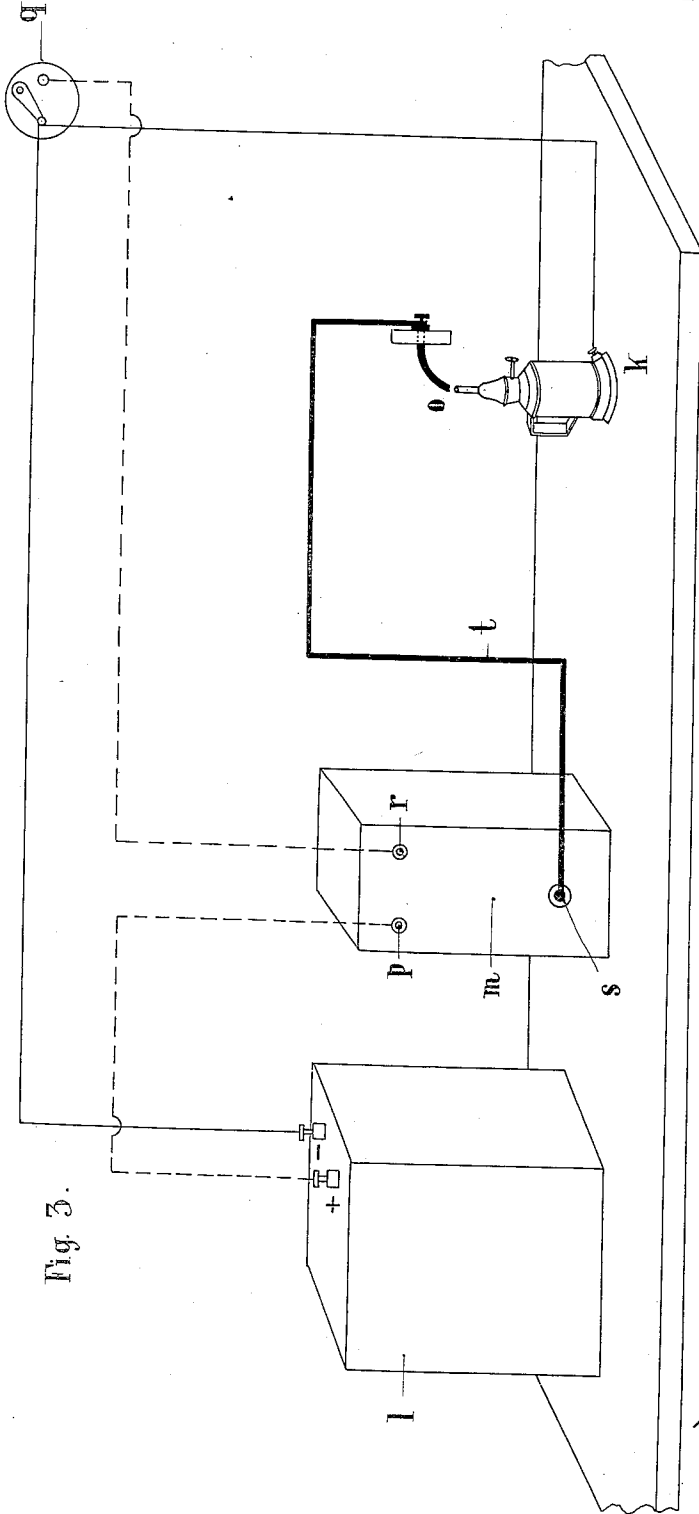


Fig. 3.

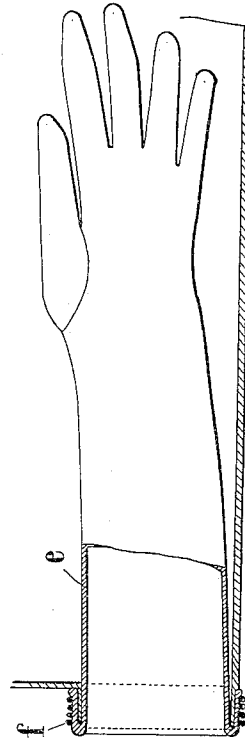


Fig. 2.

INVENTOR
Antoine Mouneyrat
BY *Lucie Paillet*
ATTORNEY

UNITED STATES PATENT OFFICE.

ANTOINE MOUNEYRAT, OF PARIS, FRANCE.

ANAEROBIC CHAMBER.

1,331,207.

Specification of Letters Patent.

Patented Feb. 17, 1920.

Application filed October 28, 1918. Serial No. 260,037.

To all whom it may concern:

Be it known that I, ANTOINE MOUNEYRAT, a citizen of the Republic of France, and resident of Paris, France, (post-office address 20 Rue de l'Abbé de l'Épée,) have invented a new and useful Anaerobic Chamber, which improvements are fully set forth in the following specification.

The present invention relates to anaerobic chambers.

The object of the invention is to provide a special chamber for allowing any substance to be safely manipulated in any gas and out of contact with the external atmosphere.

In order to understand the invention more clearly reference is made to the accompanying drawings which show by way of example one way of carrying out the invention.

Figure 1 is a perspective view.

Fig. 2 is a detail view showing the method of mounting the manipulating gloves in the openings of the chamber.

Fig. 3 shows on a larger scale an arrangement for detecting the presence of air in the chamber.

The anaerobic chamber of the present invention consists of an entirely closed box *a* preferably of parallelepiped shape. On the front side of said box are provided three openings *b c d* and on the rear side two openings *b'* and *d'* facing the openings *b* and *d* respectively in the front side. The openings *b* and *b'* and *d* and *d'* are large enough to allow free passage to the hands and arms of the operator; the central opening *c* is large enough for the admission of the various objects and apparatus to be used in the box.

Long flexible rubber gloves *e* are inserted into the interior of the box through each of said openings *b b'* and *d d'* as shown in Fig. 2. The wrists of said gloves are turned over and the overlapping parts are fastened at *f* to flanges provided around the openings *b b' d d'*. The overlapping parts of the glove *e* are firmly bound around the flanges. By means of these gloves the operator can work in the interior of the box without fear of the external air gaining access to the interior.

The only part where air could possibly enter the box is through the opening *c*. In order to prevent such access of air a large flexible rubber tube, of about 2 to 3½ feet

in length is secured over the opening *c* and hangs down outside the box. This rubber tube plays in the first place the same part as the rubber tube which hangs down from a balloon that is charged with hydrogen or coal gas; but it serves also as will be explained, as an air-lock which allows any required objects or chemical products to be inserted in and removed from the box without fear of mixing the outer atmosphere with the interior atmosphere of the box.

To insert any object into the box the said object is introduced at the end of the rubber tube. The end of said tube being then held firmly, the object is caused to move forward in the tube by working on it from the outside; when the object has reached the opening *c* the operator takes hold of it with his hands after having inserted the latter in the gloves *e*.

In order to produce the necessary atmosphere in the interior of the box the desired gas can be introduced by various means. A quick and easy method consists in introducing the gas by means of a radiator *g* placed at a suitable position in the apparatus, for instance as shown in Fig. 1 on the right hand side of the apparatus. This radiator consists of a tube *h* extending into the interior of the box and connected with a series of small vertical tubes *i* perforated at intervals with holes through which the gas for filling the box is discharged. By means of this radiator *g* the gas which may for instance be nitrogen displaces the air of the box through the holes *j* in the left hand side of the box Fig. 1. As soon as all the air has been driven out, the holes *j* are closed by means of stoppers or taps. The gas inlet is closed by means of a tap or other means.

If the box is charged with an inert gas such as nitrogen, it is necessary to be able to ascertain at any moment whether the gas has become mixed with oxygen from the outer atmosphere.

In order to ascertain this a gas analysis could be made by collecting gas from the interior of the box, for instance through one of the openings *j*; however it is much simpler and more expedient to operate in the following manner:—

As shown in Fig. 3 a benzene or the like lamp *k* is placed, for instance, at the right hand side near the front of the box. Said

lamp can be lighted at will by means of an electric current, but will not burn unless the atmosphere of the box contains oxygen. The method of lighting the lamp is as follows:—

An accumulator *l* and a sparking coil *m* are placed outside the box and a lamp *k* provided with a copper igniter *o* is placed inside. The positive terminal of the accumulator is connected to the terminal *p* of the sparking coil; the negative terminal of the accumulator is directly connected to the lamp, which itself is conductive, by way of the first terminal of the switch *q*. The second terminal *r* of the sparking coil is connected to the second terminal of the switch. The igniter of copper wire is connected to the terminal *s* of the sparking coil by a rubber insulated wire *t*. The proper distance between the igniter *o* and the burner of the lamp *k* is about 3 to 4 mm. If oxygen is present in the box the lamp is lighted by the sparks produced between the igniter *o* and the burner of the lamp; if there is no oxygen present the lamp does not light. The switch *q* enables the lighting sparks to be passed or stopped at will. If the lamp lights it indicates that oxygen is present in the box, in which case the air must again be displaced with nitrogen.

The chamber of the present invention may be used for many purposes, but it will suffice to mention some of them:—

1. With such a chamber one can safely manipulate substances which evolve the most dangerous vapors.

2. Any substance can be manipulated in any gas without fear of such substance undergoing alteration through contact with the outer atmosphere.

3. Inasmuch as the interior of the chamber can be heated electrically, chemical re-

actions can be carried out in any gas at any desired temperatures.

4. By the aid of this chamber the behavior of vegetable cultures and microbes in a gas of any composition can be studied.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An anaërobic chamber for safely manipulating any substance in any gas and out of contact with air, comprising a completely closed box provided with a plurality of manipulating hand holes, long soft manipulating gloves extending through said hand holes into the interior of said box, each glove being firmly secured with its open end to one of the said hand holes so as to make an air tight joint, an opening provided with a long rubber adapted to prevent all communication between the interior of the box and the outer air and serving to introduce the objects to be manipulated into said box, and means for removing air from said box.

2. An anaërobic box as set forth in claim 1 in which the air is displaced from the box by a current of gas discharged from a jet provided within said box.

3. In an apparatus as set forth in claim 2, means for detecting the presence of air in the box comprising a benzene or the like lamp at the top of which electric sparks are produced, which sparks light said lamp when any oxygen is present inside the box.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

DR. A. MOUNEYRAT.

Witnesses:

BRUGIOTTI,
JOHN F. SIMONS.