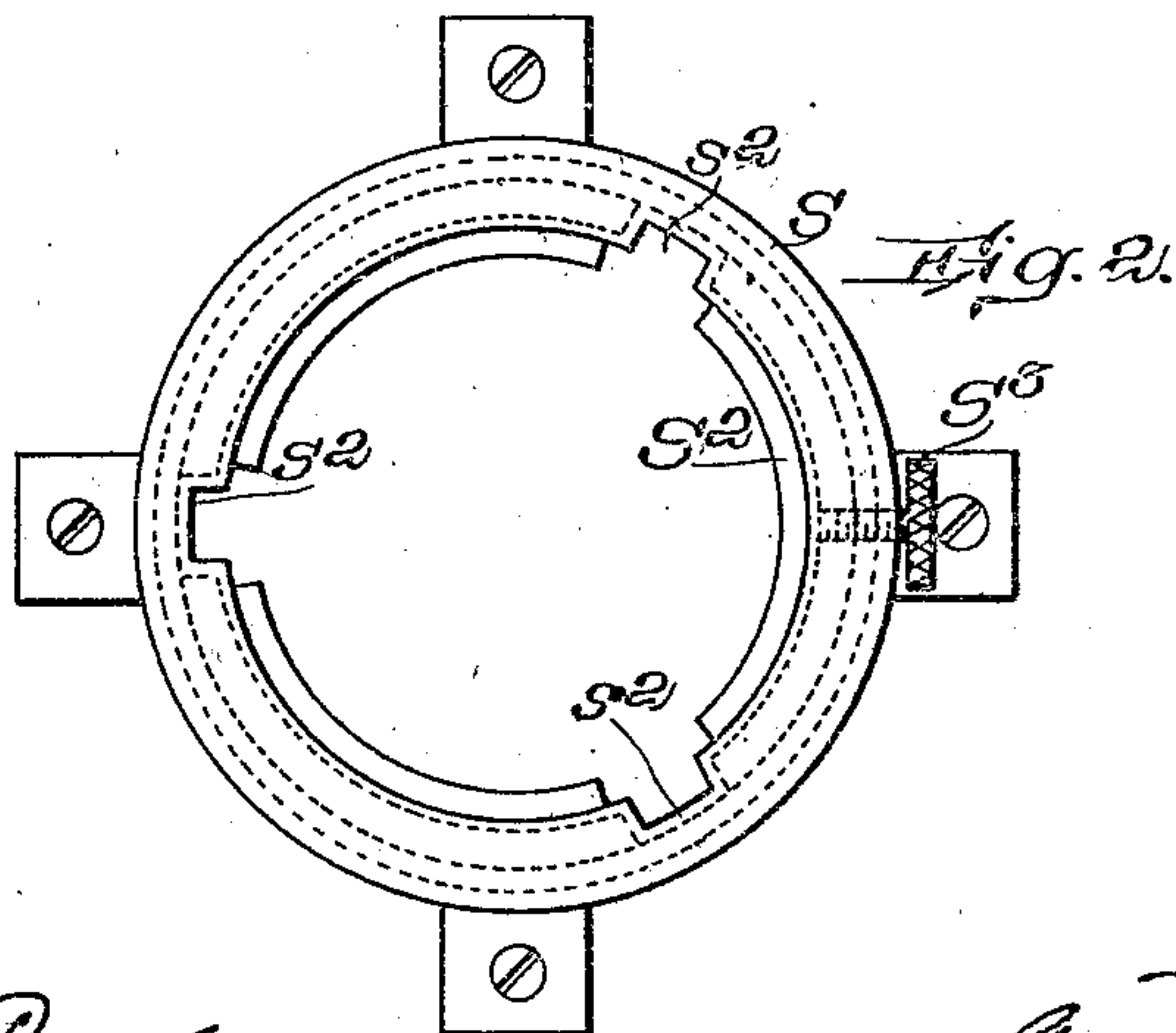
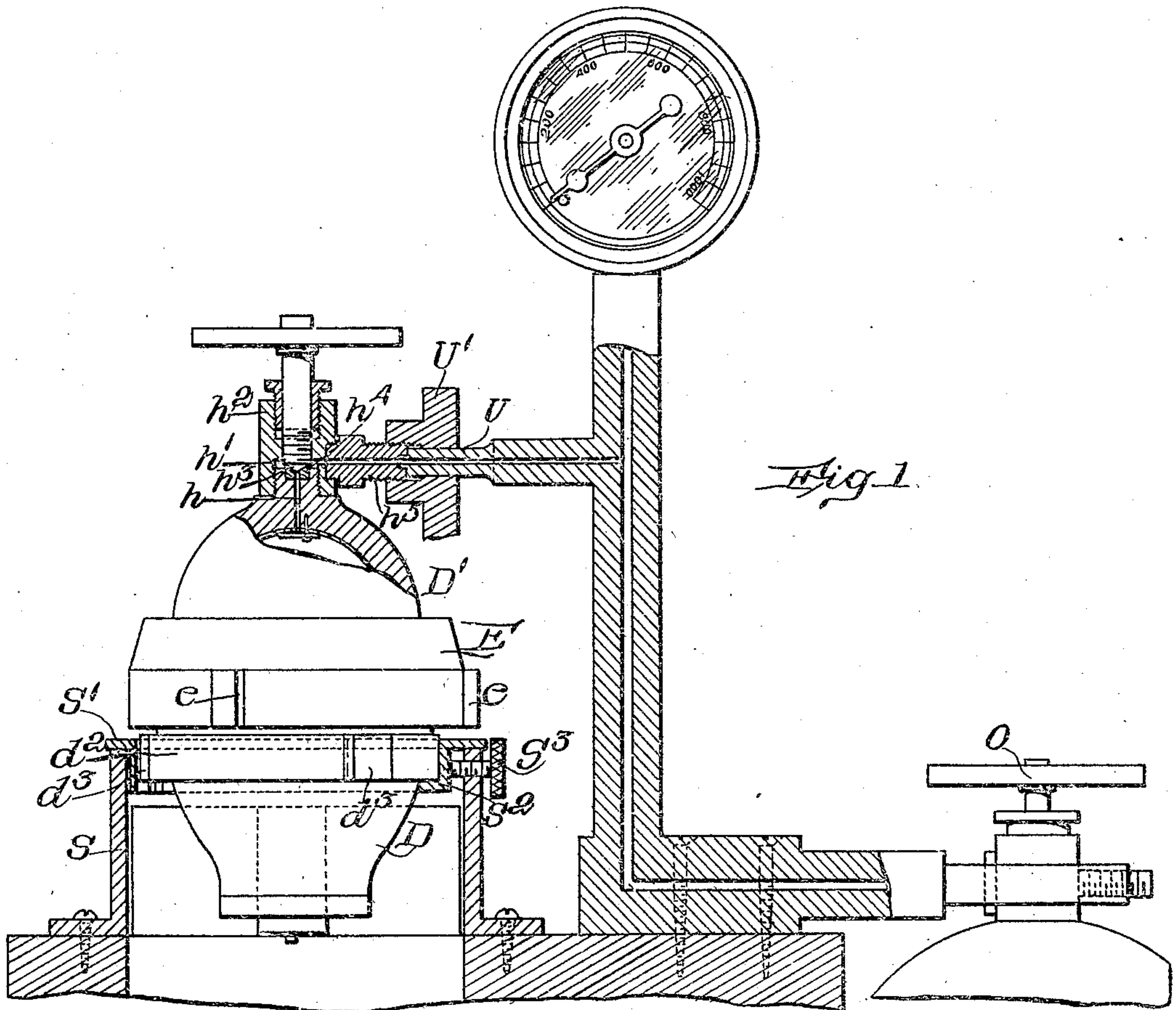


C. J. EMERSON.  
CHARGING DEVICE FOR CALORIMETER BOMBS.  
APPLICATION FILED JULY 9, 1909.

959,488.

Patented May 31, 1910.



Witnesses:  
Joseph H. Ryan  
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Attys.



# UNITED STATES PATENT OFFICE.

CHARLES J. EMERSON, OF PROVIDENCE, RHODE ISLAND.

CHARGING DEVICE FOR CALORIMETER-BOMBS.

959,488.

Specification of Letters Patent.

Patented May 31, 1910.

Original application filed August 20, 1908, Serial No. 449,445. Divided and this application filed July 9, 1909. Serial No. 506,733.

*To all whom it may concern:*

Be it known that I, CHARLES J. EMERSON, a citizen of the United States, and resident of Providence, in the county of Providence and State of Rhode Island, have invented new and useful Improvements in Charging Devices for Calorimeter-Bombs, of which the following is a specification.

My invention relates to devices for charging calorimeter bombs with gaseous contents, and has for its object the provision of apparatus whereby the requisite gases for combustion may be introduced into the bomb without danger of disturbing the arrangement of combustible material and the igniting devices within the bomb.

In making calorimetric tests with so-called bomb calorimeters, it is necessary to place the combustible material to be tested inside the calorimeter bomb in a suitable holder or receptacle therefor and to arrange electric ignition contrivances wherewith to ignite the fuel after the bomb is closed and in position in the calorimeter. The arrangement of the combustible material and its igniting devices is necessarily delicate and considerable difficulty has been heretofore encountered by reason of the susceptibility of the contents of the bomb to accidental disarrangement. After the bomb has been closed it has to be subjected to more or less manipulation before being placed in the calorimeter, and every movement and handling of the bomb is a source of danger to the proper adjustment of its contents. Bombs of this character frequently have to be charged with measured amounts of oxygen, and therefore must be manipulated for this purpose; my improvements presently to be described relate to apparatus whereby these essential manipulations of the calorimeter bomb are facilitated and rendered free from the dangers of disturbing the contents of the bomb which heretofore have given so much trouble.

In the drawings hereto annexed, Figure 1 is a view in elevation and partly in section of a calorimeter bomb, supports, and gas charging devices; and Fig. 2 is a plan view of the bomb holder shown in Fig. 1.

The calorimeter bomb shown in the drawings is the subject-matter of an application for a patent heretofore filed by me in the United States Patent Office on or about August 20, 1908, serially numbered 449,445,

whereof the present application is a division. This bomb consists of two cup-shaped members D and D<sup>1</sup> united by means of a nut E, which is provided with lugs e for engagement with a spanner or wrench wherewith the two cup-shaped halves of the bomb are firmly united in much the same manner as the two members of a pipe coupling are united by the nut thereof.

The lower half D of the calorimeter bomb is provided with an annular projection d<sup>2</sup>, from which lugs d<sup>3</sup> project radially. Secured to a bench or other firm support there is provided a stand S upon which rests a supporting ring S<sup>1</sup> which is formed with a ledge S<sup>2</sup>, the ledge and ring being notched at s<sup>2</sup>. This annular support S<sup>1</sup> is revoluble upon the stand S, and is moreover so proportioned that the calorimeter bomb may be supported by the ring S<sup>1</sup>, the annular projection d<sup>2</sup> upon the cup D of the bomb resting upon the ledge S<sup>2</sup> while the lugs d<sup>3</sup> project into and are engaged by the notches s<sup>2</sup>.

At the top of the bomb in the dome formed by the inverted upper cup D<sup>1</sup> there is an oxygen inlet passage h connected with the interior of the bomb and with the valve chamber h<sup>1</sup> formed within the valve casing h<sup>2</sup>. This inlet passage h is controlled by the valve h<sup>3</sup> whereof the spindle is screw-threaded in the valve casing h<sup>2</sup> and is adapted to be seated upon the valve seat h<sup>4</sup> which is made of vulcanite or other suitable material to insure a tight joint when the valve is closed. A short pipe h<sup>5</sup> laterally projecting from the valve casing h<sup>2</sup> is adapted to be connected with the oxygen apparatus for charging the bomb with oxygen.

Adjacent to the stand S and secured to the same support therewith, there is provided the charging pipe U which communicates with an oxygen receptacle, as O, and is adapted to be coupled securely to the short pipe h<sup>5</sup> as by the coupling nut U<sup>1</sup>. This oxygen delivery pipe is rigid and permanently fixed in proper relation to the stand S. When the bomb as above described has been placed upon the supporting ring S<sup>1</sup> upon the stand S, it may then be turned with the supporting ring until the pipe h<sup>5</sup> registers with the oxygen pipe U; then the supporting ring S<sup>1</sup> is clamped in position by means of the screw S<sup>3</sup> so that subsequent manipulation of the oxygen pipe coupling can by no possibility disturb the calorimeter



bomb or its contents. The two pipes  $h^5$  and U may then be coupled together, and thus the oxygen pipe may be connected with and disconnected from the bomb without danger of jarring the bomb or disturbing its contents. When the bomb has been filled with oxygen to the desired pressure, the valve  $h^3$  is closed, the oxygen receptacle O shut off, and the coupling  $U^1$  released when the bomb is ready for use in the calorimeter can.

It will be seen that by the use of a rigid oxygen pipe, fixed with relation to the stand so as to hold the bomb in proper connective relationship with the oxygen delivery conduit, it is possible to do away with all flexible piping and with its inconvenience and tendency to cause disarrangement of the contents of the bomb.

What I claim and desire to secure by Letters Patent is:—

1. A support for a bomb of the character described, comprising a frame or standard, an annular holder adapted to hold a bomb mounted on said standard and angularly adjustable thereon in a horizontal plane, and means to fix said annular holder in said adjusted position.

2. The combination with an oxygen supply apparatus having a rigidly fixed delivery conduit adapted to be connected with the gas inlet port of a bomb, and a holder for the bomb revolubly mounted upon an axis fixed with relation to the oxygen delivery conduit and adapted to hold the bomb in connective relationship with the oxygen delivery conduit.

3. The combination with an oxygen supply apparatus having a rigidly fixed delivery conduit adapted to be coupled with the gas inlet port of a bomb, and a support for the bomb comprising a standard and an annular bomb holder adapted to hold the

same in coöperative relationship with said oxygen delivery conduit, the said holder mounted on the standard and angularly adjustable therein, and means to fix said annular support in adjusted position.

4. A support for a bomb of the character described, comprising a frame or standard, an annular holder provided with notches to engage projections on and thus to hold a bomb mounted on said standard, the said holder being angularly adjustable on the standard in a horizontal position and means to fix said annular holder in said adjusted position.

5. The combination with an oxygen supply apparatus having a rigidly fixed delivery conduit adapted to be connected with the gas inlet port of a bomb, and a holder for the bomb revolubly mounted upon an axis fixed with relation to the oxygen delivery conduit, said holder provided with notches adapted to engage projections on and to hold the bomb in connected relationship with the oxygen delivery conduit.

6. The combination with an oxygen supply apparatus having a rigidly fixed delivery conduit adapted to be coupled with the gas inlet port of a bomb and a support for the bomb comprising a standard and an annular bomb holder provided with notches adapted to engage with projections on and thus to hold the bomb in coöperative relationship with said oxygen delivery conduit, the said holder mounted on the standard and angularly adjustable therein, and means to fix said annular support in adjusted position.

Signed by me at Boston, Massachusetts this first day of July 1909.

CHARLES J. EMERSON.

Witnesses:

ROBERT CUSHMAN,

CHARLES D. WOODBERRY.