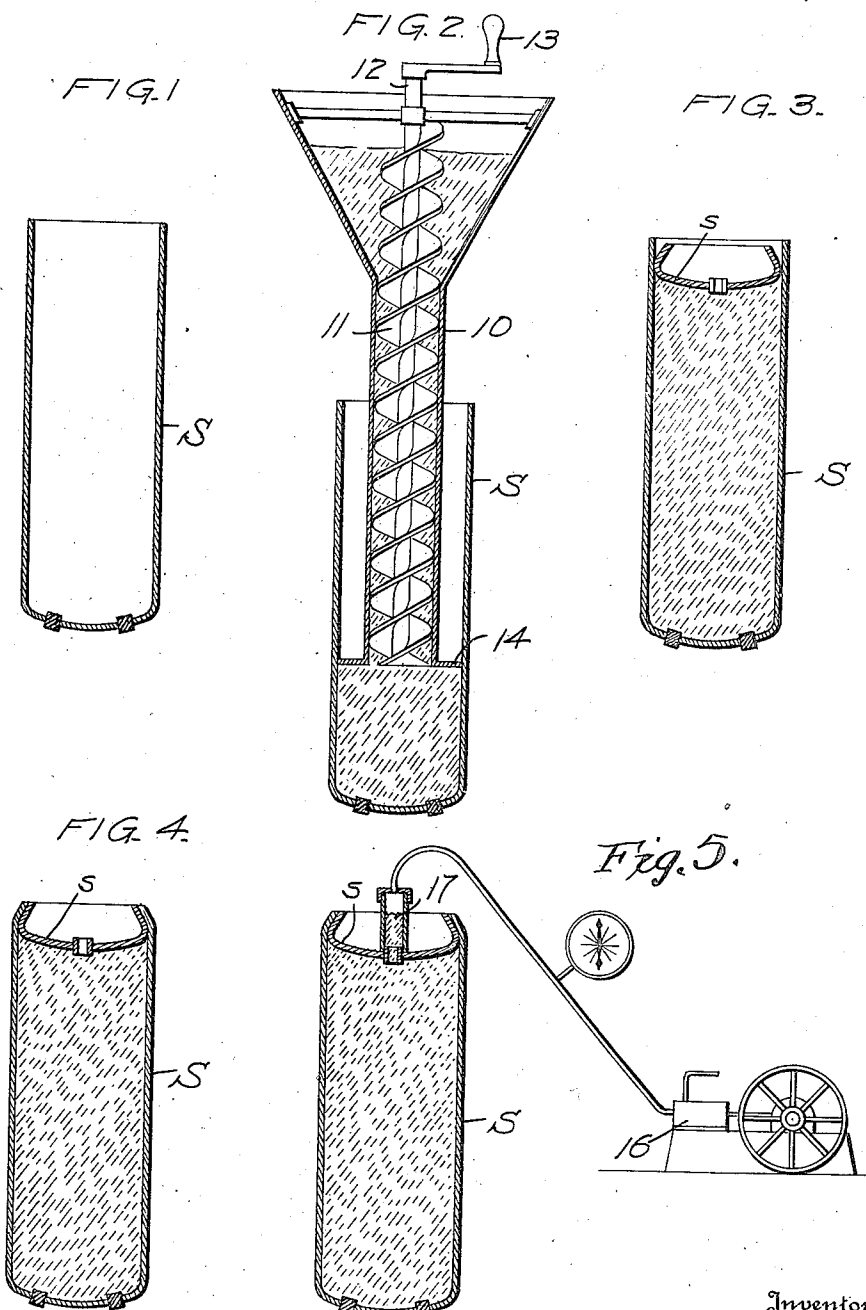


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METHOD OF MANUFACTURING CYLINDERS FOR DISSOLVED ACETYLENE.
APPLICATION FILED JULY 5, 1916.

1,407,588.

Patented Feb. 21, 1922.



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UNITED STATES PATENT OFFICE.

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To all whom it may concern:

Be it known that we, ORAMEL H. SKINNER, a citizen of the United States, residing at Indianapolis, Marion County, and State of Indiana, and HENRY SIDNEY SMITH, a citizen of Great Britain, residing at Indianapolis, Marion County, and State of Indiana, have invented and discovered certain new and useful Improvements in Method of Manufacturing Cylinders for Dissolved Acetylene, of which the following is a specification.

In the manufacture of tanks or cylinders for containing dissolved acetylene it is necessary to completely fill the cylinders with a porous material of known porosity. It has been customary heretofore to fill the cylinders with porous material in the form of porous blocks made from appropriate material such as fibres of asbestos cemented together by silicate of soda or other appropriate ceramic adhesive or with a porous ceramic filling mixed with charcoal or a like substance and asbestos which is filled into the tank or cylinders in a pasty condition, and afterwards dried out. When the porous blocks are employed in order to insert the same into the cylinders, it is necessary that one end of the cylinder be fully open. This opening has later to be closed with a steel end which may be attached to the shell by a screw joint or be crimped in, welded or brazed. After this operation the cylinder must be tested. Due to the fact that water would be injurious to the porous blocks, hydraulic testing is impractical. Pneumatic testing is objectionable. When the pasty ceramic porous filling is employed, it has been the practice to employ cylinders with a small opening in the end (which hole later receives the valve) similar to those employed for carbon dioxide or oxygen. These cylinders can be tested hydraulically before the filling in of the porous substance, but the filling in of the porous substance through the small opening in the end has been found to be a tedious and expensive process.

The purpose of our said invention is to provide a method of placing a porous pasty ceramic filling material in a cylinder through a large opening and permit of hydraulic testing of the cylinder after the large opening

is closed in without injuring the porous substance, and providing an acetylene container, or cylinder, completely filled with porous material of a uniform porosity throughout, and in which no extra voids or air spaces can exist; and also in which the degree of porosity has been determined and uniformly attained.

In carrying out our invention, we provide a process which proceeds with regular successive steps which will now be described, and, for the purpose of enabling the description to be better understood, the accompanying drawing is made a part hereof and will be referred to herein.

In said drawing, Figure 1 represents the steel shell S after it has been finished and is ready for filling, the heads of the shell being shown alongside thereof.

In filling said shell in accordance with our process, a suitable packer is employed, such as illustrated in Figure 2. Said packer consists of a shell 10, with a hopper-like top containing spiral or auger packing blades 11 mounted on a shaft 12 journaled in appropriate bearings and adapted to be operated by a crank 13.

The material with which the shell is to be filled is first prepared and consists of approximately 20% inert material and approximately 80% water. This plastic or semi-liquid mass is carefully prepared, freed from air, and placed in the hopper of the packing device. This material may of course be composed of the ingredients heretofore suggested or any that may be found appropriate and the term "ceramic," as used in the claims, is intended to have such interpretation. The lower end of the packing device is inserted within the open end of the shell, being provided with a flange 14 around its lower end, which fills the cross-area of the shell, as shown. By turning the crank 13, the mass in the hopper is forced into the shell, and as the mass is forced through the lower end of the packing device, said packing device raises until the shell is filled to the point desired adjacent to the top.

The head s is then placed in position, as indicated in Figure 3, after which the top of the shell is swaged inward to impinge against the tapered edge of the head, as indicated in

Figure 4. The joint between the head and the shell is then welded, when the device is ready for testing.

Heretofore it has been practically impossible to have every cylinder tested with hydrostatic pressure, and the Interstate Commerce Commission rulings were so made that each cylinder could be tested under air pressure, and one in each 200 tested hydrostatically. With the method of filling herein described, there will be no difficulty in having each cylinder tested hydrostatically.

In Figure 5 is shown the hydrostatic testing outfit 16, attached to a small cylinder 17 secured in the valve opening in the head and containing a small additional quantity of the plastic material. The hydrostatic test is then applied, and if, because of any imperfection in the filling operation there should be any voids or spaces in the mass of material, this additional quantity in the small cylinder 17 will be forced into the large cylinder and such spaces or voids filled up, thus insuring a uniform porosity and packing of the material throughout the cylinder.

After the test is completed, the cylinder may be weighed and its weight recorded. It is then ready for the baking process to which all plastic materials of this nature and for this purpose are subjected. When the baking is completed, the cylinder is again weighed and the difference between the original weight and the weight after baking will define the amount of water driven off and, from this, the porosity of the cylinder can be readily calculated.

By this method, we are able to know definitely concerning the porous space, or porosity, of such dissolved acetylene cylinders, whereas, by the process in present use, this information cannot be obtained of a definite and reliable character because of the reasons heretofore given.

The maximum porosity desired for acetylene cylinders of this character is 80%, and by this method we are able to gauge this porosity to exactly the degree desired to secure the best results.

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

1. The method of filling containers with

porous substance which consists in packing said container with a ceramic mass of predetermined consistency, closing the open end of the container, applying the hydrostatic test, and then baking.

2. The method of filling containers for dissolved acetylene with porous material which consists in packing said container with the material in semi-liquid form, closing the cylinder, applying hydrostatic pressure and interposing a small additional quantity of the semi-liquid material in the path of the hydrostatic pressure, then baking the cylinder to remove the liquid, substantially as set forth.

3. The method of filling containers for dissolved acetylene with porous material which consists in packing said cylinder through an open end thereof with semi-liquid ceramic material, closing the open end of said cylinder, placing in communication therewith a small cylinder containing an additional supply of said semi-liquid material, applying hydrostatic pressure to said small cylinder, and then subjecting the cylinder to a baking process, substantially as set forth.

4. The process of filling cylinders for containing dissolved acetylene with porous material which consists in filling the cylinder with a prepared ceramic mass in semi-liquid form, closing the cylinder, attaching a smaller cylinder containing a portion of the filling mass, applying hydrostatic pressure thereto, and baking, substantially as set forth.

5. The process of filling dissolved acetylene cylinders with porous material which consists in first filling the cylinder with a prepared semi-liquid ceramic mass, closing the cylinder, forcing a further supply of said material therinto under appropriate pressure, and then baking, substantially as set forth.

In witness whereof, we have hereunto set our hands and seals at Indianapolis, Indiana, this 22nd day of June, A. D. nineteen hundred and sixteen.

ORAMEL H. SKINNER. [L. S.]

HENRY SIDNEY SMITH. [L. S.]

Witnesses:

JACOB HARDING,

MORRIS MOSKOWITZ.