E. P. Vaux,

Water Pipe,

No. 69,869, Patented Oct. 15, 1867.

Fig: 1

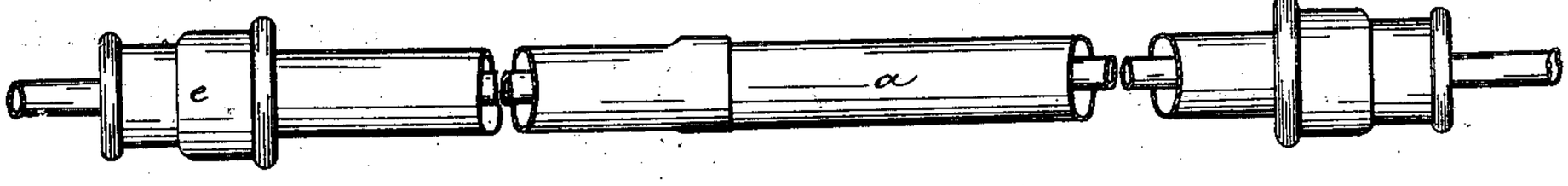

Fig: 2

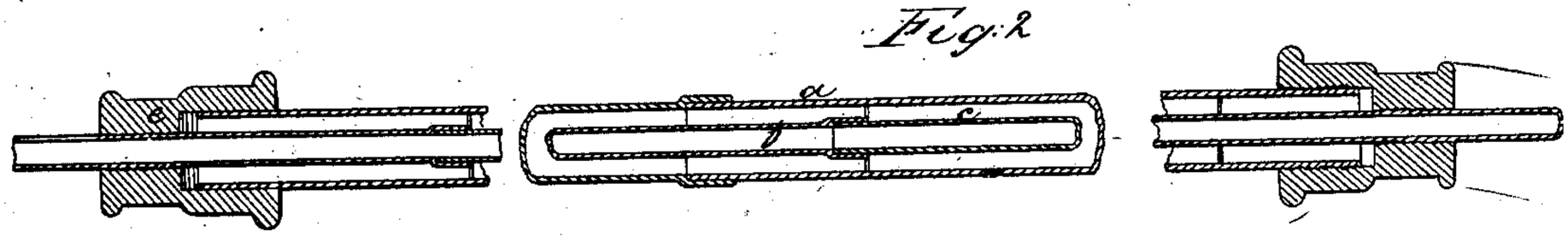

Fig: 3.

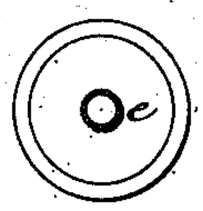

Fig: 4

Fig: 5

Fig: 6

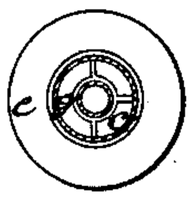

Fig: 7.

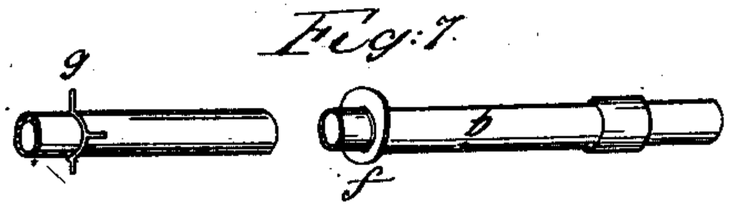

Fig: 8

Witnesses
Saml. F. Carr—
W. G. Stennett

Inventor
E. P. Vaux

UNITED STATES PATENT OFFICE.

ETHAN P. VAUX, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN PIPES FOR THE TRANSMISSION OF FLUIDS.

Specification forming part of Letters Patent No. **69,869,** dated October 15, 1867.

To all whom it may concern:

Be it known that I, ETHAN P. VAUX, of the city of Washington, in the District of Columbia, have invented a new and useful Improvement in Pipes for the Transmission of Fluids; and I also declare the following to be a full and particular description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, in which—

Figure 1 shows an exterior view. Fig. 2 shows a longitudinal section. Fig. 3 shows an end view of the connected pipes. Fig. 4 shows transverse sections through pipes, showing support by means of disks. Fig. 5 shows transverse sections through pipes, showing support by means of radial pins or wires. Fig. 6 shows sections through pipes and cap. Fig. 7 shows inner pipe, with disk and radial supports. Fig. 8 shows an air-tight pipe or casing of wood.

Corresponding parts are represented by the same letters.

In pipes for the transmission of water, gas, or other fluids, great inconvenience, damage, and loss have always been experienced from changes of temperature in the expansion, contraction, or congealing of fluids, in the liquidizing of gases, and in the bursting of pipes. To remedy these disadvantages many expedients have been resorted to, such as clothing the pipes, embedding them in various substances, packing them or covering them with imperfect conductors of caloric; but when these substances become moist they at once become good conductors, and thus defeat the object of their application; and as a consequence they are not to be relied on, and all persons laboring in the arts requiring their application are at the great disadvantage of using pipes without adequate means of protecting them and the fluids passing through them.

To remedy this is the object of the present invention, which consists in the construction of an article of manufacture at once cheap, efficient, and durable for the purpose in view.

It is known to all that there is no agent in nature so effective in resisting the transmission of heat as a wall of air confined in an inclosed chamber, (as shown by letter *c*,) and that though varying in volume under the influence of temperature, its elastic character renders its retention easy and safe within the range of temperature required for all the uses contemplated in this invention.

To secure the use of this agency to the best advantage I construct pipes or tubes, cylindrical in form by preference, though any form will answer, and having them of two sizes, as at *a* and *b*, Fig. 2. I place one within the other, keeping them equidistant from each other throughout their length, and held in their position by suitable means, as blocks of some non-conducting material, radial wires or pins, or disks, (as shown at *f* and *g*, Figs. 4, 5, 6, and 7,) at or near the ends of the sections of the inner pipes, or at other points, if desirable, in consequence of the weight of the inner pipe or its contents. I prefer a complete disk, hermetically sealed, in each case, which can readily be done by wedging them against a slight rim on the external or internal pipe, or both, in order that each section shall be in itself an isolated air-chamber, thus securing the remainder of the pipe from damage in case of injury to any section, and thereby increasing the desired security.

The ends of pipes thus constructed must, of course, be guarded by heads or caps, as at *e*, though a simpler form than is shown on the drawings is obvious, and, in fact, many methods might be suggested, the only object being to connect the pipes in such a manner as to hermetically seal the air-chamber between them. The screwed joint shown in the drawing, though convenient is not essential. It may also often appear advisable to place strengthening rings or supports on the outer pipes at intervals, if the internal pipe is of excessive size and weight, and exposed to a very low temperature.

No explanation is necessary with regard to the best mode of making either the internal or external pipes for the uses herein specified, as this belongs to arts in successful general practice, both in metal and other materials.

When pipes are to be fixed in their respective positions by means of radial wires or pins inserted through perforations in the external pipes, the perforations must be entirely and hermetically sealed in the process of securing the pin in its position; but pins may be applied radiating from collars fitted to the inte-

rior pipe, as shown at *g*, Fig. 7. When disks are to be applied for this purpose, which is regarded as the preferable mode, they should be formed loose enough to pass down easily to the desired position, when they may be expanded by blows from an instrument prepared for the purpose. Solder may also be applied, if desirable, for a special purpose, but in general use it will not be needed.

When blocks are used it will only be necessary to level up the inner pipe by blocks of suitable size, if the pipes are laid in a horizontal position, and will be ample in case of large water or gas pipes, laid below the surface of the earth.

Elbows may be secured by forming the joints at the angles, or by miters, or by enlarging the outer pipe at those points, if desirable.

Although I have spoken chiefly of metal pipes in describing this invention, it is obvious that the same principles of construction, especially in the outer covering, and the various connections, apply to any desired material, as terra-cotta, cement, or any material capable of manufacture into pipes, as wood properly calked with paper, using coal-tar, paint, or other substance to exclude air, the material used not affecting the invention.

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

1. A pipe constructed and arranged for the transmission of fluids, having a hermetically-sealed air-chamber surrounding it, substantially as described.

2. In combination therewith, the intermediate braces, whether consisting of disks or other radial supports, or supports of horizontal pipes, substantially as described.

3. A twofold pipe, the interior being a conduit for fluids, and the outer forming a hermetically-sealed air-chamber, when united at its curves or angles, substantially as described.

ETHAN P. VAUX.

Witnesses:

SAML. F. CARR,

W. G. STEINMETZ.