

(No Model.)

W. J. FRYER.
CLAY PIPE.

No. 474,006.

Patented May 3, 1892.

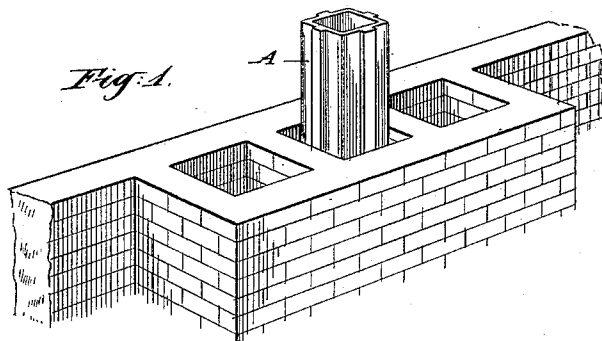


Fig. 2.

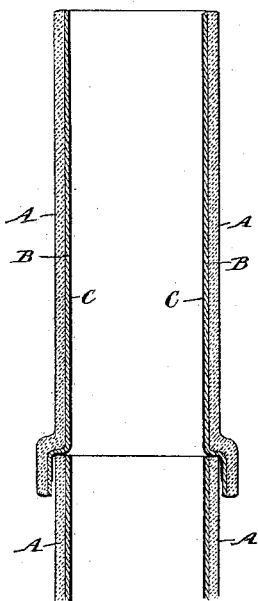


Fig. 5.

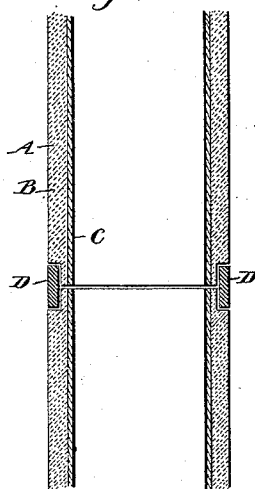


Fig. 3.

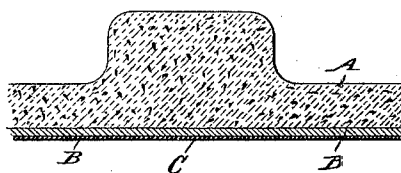
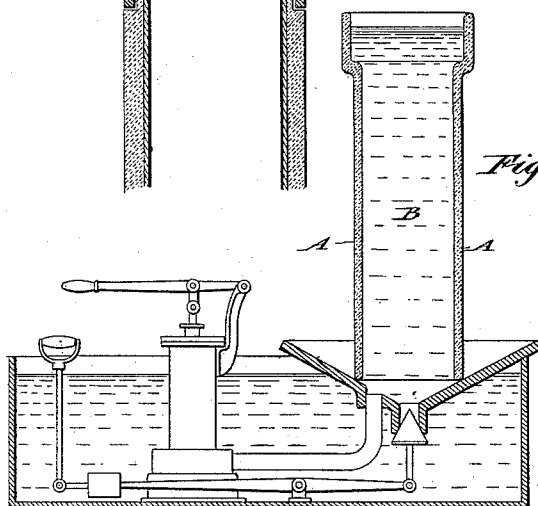


Fig. 4.



Witnesses:

Charles R. Searle,
M. F. Boyle.

Inventor:

W. J. Fryer
by his attorney
James D. Watson

UNITED STATES PATENT OFFICE.

WILLIAM J. FRYER, OF NEW YORK, N. Y.

CLAY PIPE.

SPECIFICATION forming part of Letters Patent No. 474,006, dated May 3, 1892.

Application filed November 3, 1891. Serial No. 410,764. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. FRYER, consulting engineer, residing in the city and county of New York, in the State of New York, have invented a certain new and useful Improvement in Pipes, of which the following is a specification.

My pipe is made in convenient lengths applied together by hub and socket ends. It is intended mainly for use in the interior of flues, either for smoke or for ventilation. The body and bell are made of what is sometimes known as "porous terra-cotta," as set forth in the patent to Gilman, dated October 11, 1881, No. 248,094. It is, briefly, a cheap terra-cotta clay thoroughly kneaded with a sufficient quantity of water and with a liberal addition of wood sawdust. The sawdust may be pine or other soft wood of the coarse quality produced by ordinary splitting-saws in the manufacture of lumber in sawmills. In the long and intense heat to which the pipes are exposed in the kiln the wood fiber is burned out and the clay portion is left in a well-burned and porous condition.

I can manufacture the bodies of the pipes by hand or by many or all of the various machines for pressing out clay pipes and producing bell ends or hubs thereon. The surface of the interior is made tight by coating with a finer clay, which is so incorporated as to become a part of the structure or by glazing the entire interior with salt glaze or other permanent glaze, or by both these methods combined. The porous condition of the main body contributes to its lightness, and the roughness of the exterior, due in part or entirely to the porous character, promotes the adhesion of lime mortar or other plastic material applied in the construction of the flue.

My improved pipe can be sawed either squarely across or obliquely at various degrees to produce angles in the flues when required.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a perspective view of a portion of a building in the course of construction with my invention applied. The remaining figures are on a larger scale. Fig. 2 is a ver-

tical section through one length of my pipe and also a portion of another length with the connecting-pipe. Fig. 3 is a horizontal section of a portion of my pipe on a still larger scale. Fig. 4 represents the apparatus for applying the fine-clay lining. It is a vertical section partly in elevation. Fig. 5 is a vertical section on the same scale as Fig. 2, showing a modification in the joint connecting two lengths together.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

A is the main body formed with the ordinary bell or hub. This body is molded by forcing through a suitable die with any ordinary means for producing the bell and rim, or it may be produced in any other way. It is essential that it shall be made of a tough clay; but it may be very coarse, and may contain elements which discolor and otherwise render it illy adapted for fine wear. With the clay I mingle coarse sawdust, preferably from soft wood, and a sufficient quantity of water, thoroughly kneaded together in a pug-mill or by other suitable means. With one hundred pounds of clay there may be about fifty pounds of sawdust, dry weight; but the proportions may be varied within wide limits. When the bodies A, molded from this material, are partly dry, the interior is bathed with a slip of the same or a different clay B, mixed with a larger proportion of water and without any sawdust or any other material to make it porous. This may be applied by setting each length in succession upon an approximately tight-fitting cone, or upon a plain table and letting in the semi-fluid slip B, from an aperture in the bottom, through which it is forced by a hand-pump or any other suitable means. It is allowed to escape again through the same or any other aperture after having thoroughly bathed the interior and remained sufficiently long in contact to penetrate and slightly soften and amalgamate with the partly-dried material A inclosing it. Now the pipes are dried again with the fine-clay coating, forming a tight inner face to the otherwise porous body. Next their interiors are washed with a salt glaze or with other proper glaze C, which may be applied by the same means as just described for the application of the fine-clay

lining, or a sufficient quantity of glaze may be applied by jetting it from a central pipe outward in all directions to thoroughly wet the whole of the interior. Care should be
5 taken not to glaze the exterior, because it is important not only that the main thickness of the bodies be porous and light, but also that the exteriors be rough to engage strongly with mortar or other cementing material when
10 they are placed in flues.

The roughness of the exterior may be promoted by applying scratching-points or other devices to the dies, or by otherwise roughening the surfaces; but I do not consider such
15 generally necessary. The liberal admixture of coarse sawdust insures that the exterior of the body and bell shall be rough.

My flue-pipes are strong and eminently light. Lightness in this class of structures is
20 important, not only in transportation, but in enabling the lowermost lengths in a tall flue to sustain the incumbent weight. Such will never be subjected to excessive crushing strain, either in the erection of the flue and
25 the insertion of the successive lengths with green mortar around them, or at any subsequent stage. The lining of fine clay B is sufficiently incorporated to become reliably and permanently united with the porous portion.
30 The glazing applies better on the fine lining than it would on the porous material directly; but I can, if preferred in any case, apply the glazing C directly upon the interior of the porous material A without the preliminary
35 coating with clay B. The smooth and tight character of the interior induced by my lining

and glazing, or either alone, promotes the movement of the air or smoke by diminishing friction, and also contributes greatly to reduce the retention of soot.

Modifications may be made in the forms. I have shown the body as cylindrical and the successive linings B and C as correspondingly circular; but they may be made in various other forms, as rectangular, or rectangular with rounded corners. The ends may be simply abutted together, instead of being made with hub and socket, as shown.

Fig. 5 shows a modification, in which the lengths are made with plain ends adapted to abut, and are joined by rings D of the section shown. These may be preferable for some situations.

The pipes may be sawed off, when required, either squarely or at any desired angle, a saw being appropriated for the purpose, as the glazing is likely to injure fine tools.

I claim as my invention—

The pipe described, composed of the porous terra-cotta body A, the lining of denser clay B, thoroughly incorporated as a unit therewith, and the glazing C, surfacing the interior of the latter, combined and adapted to serve as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

WM. J. FRYER.

Witnesses:

M. F. BOYLE,
H. A. JOHNSTONE.