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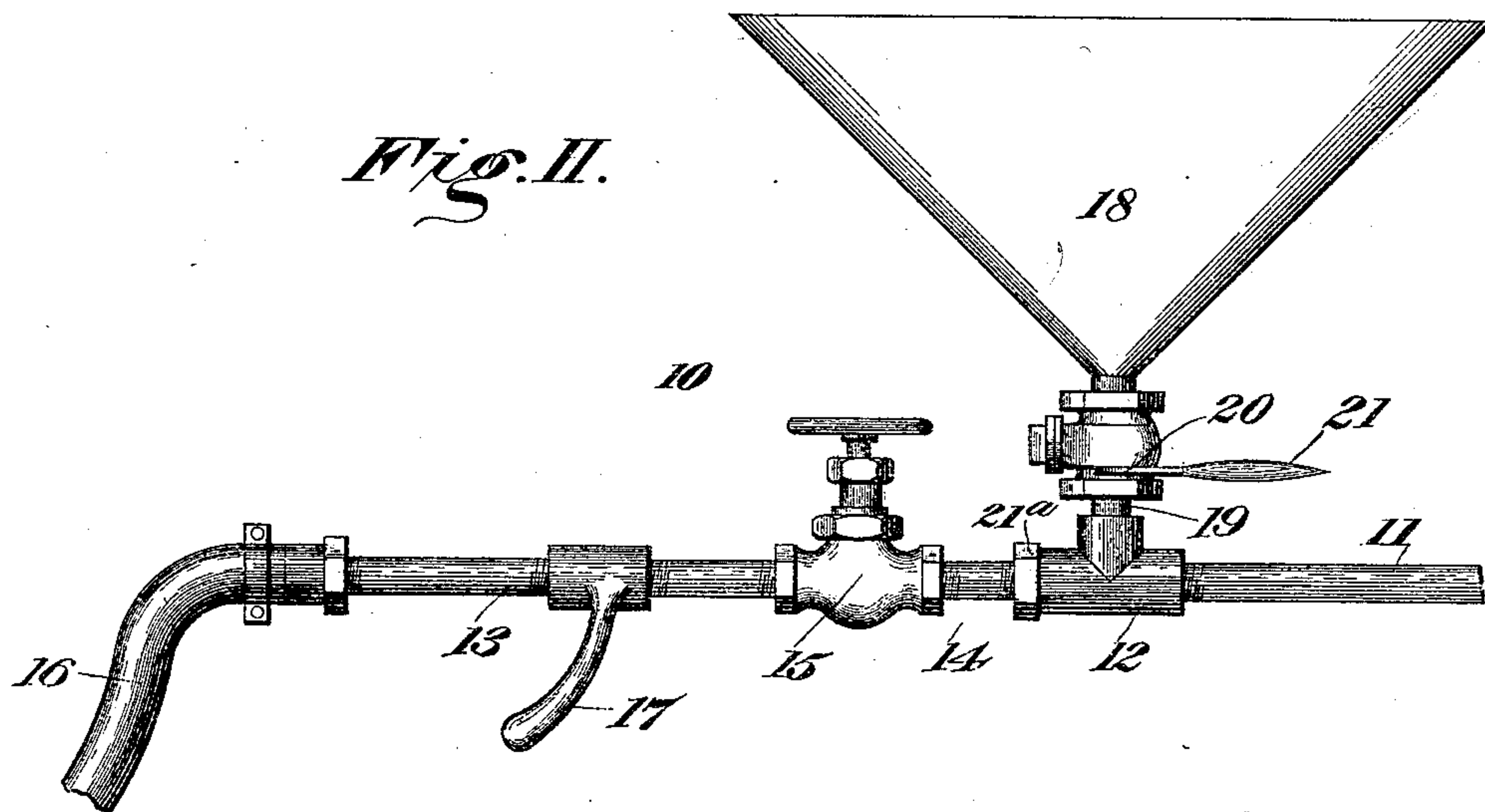
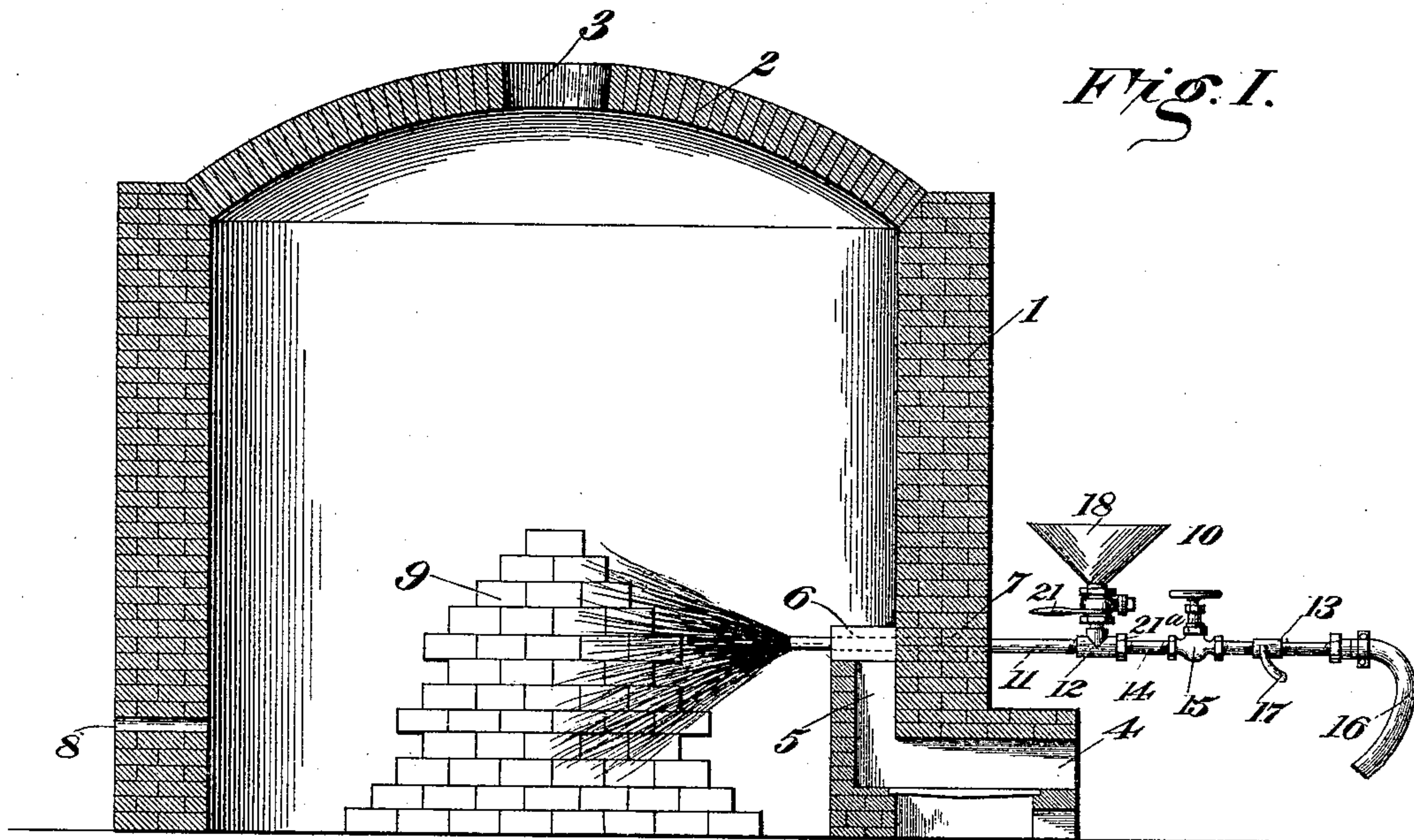
2 Sheets—Sheet 1.

W. A. LONG.

PROCESS OF GLAZING EARTHENWARE AND APPARATUS THEREFOR.

No. 543,741.

Patented July 30, 1895.



Witnesses

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S. M. Wacker

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Attorney

(No Model.)

2 Sheets—Sheet 2.

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Fig. III.

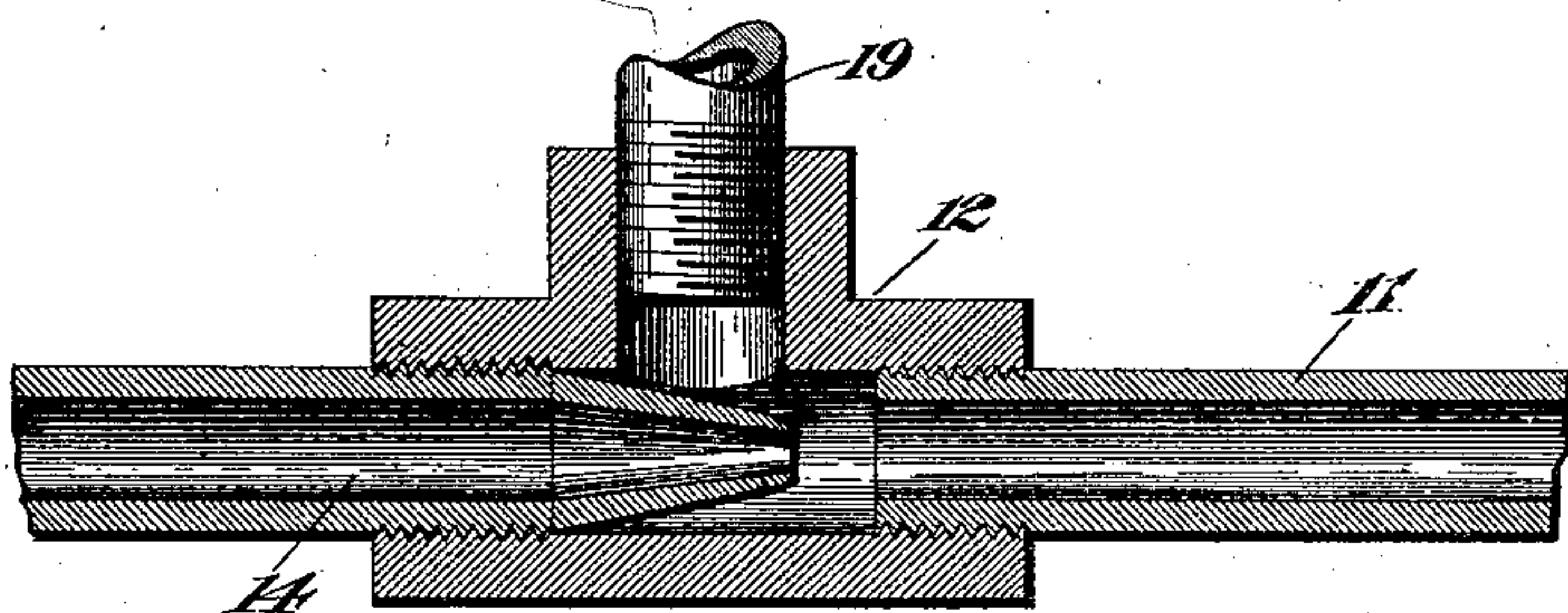
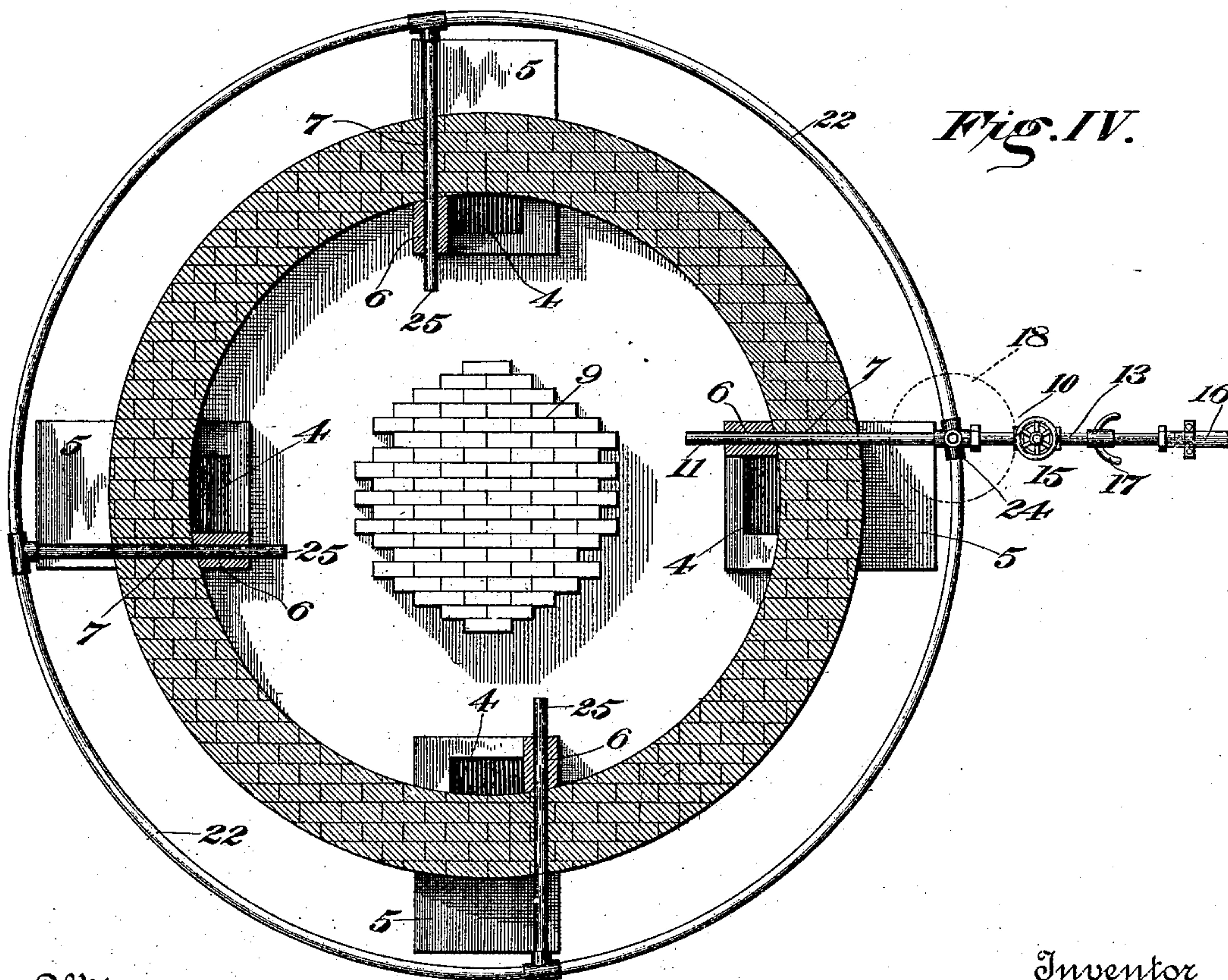


Fig. IV.



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UNITED STATES PATENT OFFICE.

WILLIAM A. LONG, OF STEUBENVILLE, OHIO.

PROCESS OF GLAZING EARTHENWARE AND APPARATUS THEREFOR.

SPECIFICATION forming part of Letters Patent No. 543,741, dated July 30, 1895.

Application filed December 20, 1894. Serial No. 532,475. (No specimens.)

To all whom it may concern:

Be it known that I, WILLIAM A. LONG, of Steubenville, in the county of Jefferson and State of Ohio, have invented a certain new and useful Process of Glazing Earthenware or the Like and Apparatus for Carrying out the Process, of which the following is a specification, reference being had to the accompanying drawings.

10 The object of my invention is to produce a process of and apparatus for glazing earthenware with a chloride of sodium or other chemical glaze in order to render the material lustrous and impermeable to liquid, as well as
15 to preserve colors and patterns thereon.

With reference to the process my invention consists in injecting the glazing substance or matter in a pulverulent or other available form, either separately or combined with organic matter to facilitate combustion into the interior of a kiln maintained at a high temperature and containing the articles to be glazed.

My invention also consists in apparatus for
25 carrying out my process.

Heretofore the ordinary salt glaze of common earthenware has been produced by throwing into the kiln at certain stages of the firing process chloride of sodium in bulk. This
30 method, however simple, is extremely unsatisfactory, because, owing to the necessity of providing sufficient space for the distribution of the salt, it is impossible to place more than a limited quantity of earthenware within the
35 kiln, and because by this method parts of the ware are not properly glazed. Similarly, by supplying to the kiln other substances—as, for instance, compound of feldspar and lime or a proper admixture of salt, potash, boracic acid,
40 sulphate of baryta, and phosphate of lime—other glazes for porcelain ware or china and stoneware may be produced.

My invention contemplates as a process the injecting or blasting into the kiln of any of
45 these or other vitrifiable or vitrifying compositions to insure a complete and perfect glazing of the ware, and its application is not restricted to any special glazing composition.

In the accompanying drawings, Figure I is
50 a central vertical section through a kiln or oven, showing the application of my invention. Fig. II is a side elevation of the in-

jector. Fig. III is a detail sectional view of a part thereof; Fig. IV, a horizontal section of a modified form of the apparatus.

Referring to the figures on the drawings, 1
55 indicates, for example, a kiln of circular form having a crown 2, provided with a central aperture 3, and equipped with furnaces 4, and “bags” 5 connecting therewith, as illustrated. 60 Above and along one edge of the bags, respectively, I prefer to employ a protecting tunnel or port 6, the exposed walls of which constitute, respectively, continuations of the horizontal injector-ports 7, that pierce the
65 walls of the kiln. I also prefer to provide injector-ports 8 between the bags and in a somewhat lower horizontal plane than the ports 7.

9 indicates a loosely-built mass of earthenware—such, for instance, as bricks within the
70 kiln—the surfaces of which are designed to be glazed.

10 indicates one of my glazing-injectors, the discharge-pipe 11 of which is inserted through the injector port and tunnel into the interior
75 of the furnace, the said tunnels or ports 6 being designed to protect them from the intense heat of the furnace.

12 indicates the body part of a three-way fitting, which may be internally screw-threaded at opposite ends for the reception of the reamed end of the discharge-pipe 11 and the front end of blast-nozzle 14, respectively, the latter preferably projecting into and being adjustable within the fitting 12. 85

15 indicates any suitable and ordinary air-cock located in an air-pipe 13, behind the blast-nozzle 14, and designed to control a blast of air derived through a flexible hose 16—for instance, from a suitable source—as, for example, an air-compressor. (Not illustrated.) 90

17 indicates handles that are preferably secured to the air-pipe 13 for manipulating and directing the injector.

18 indicates an injector supply-funnel communicating from above with the body part 12 of the three-way fitting through a branch 19 and a gate-valve 20, provided with handle 21, as illustrated. 95

The operation of my apparatus is as follows: 100 The air-supply being ready for use and the discharge-pipe 11 of the injector having been inserted through an injector-port 7 and tunnel 6, a quantity of glazing material in any

suitable form—as, for example, pulverulent, semi-pulverulent, or liquid—is supplied to the funnel 18 and the cock 15 is opened. Thereupon a blast of air from the nozzle 14 will be discharged into the interior of the body part 12 of the three-way fitting and into the contiguous reamed end of the discharge-pipe 11, which conducts the blast to the interior of the furnace. As soon as the blast is properly working, the gate-valve 20 is opened sufficiently to permit a required quantity of the glazing material to escape from the funnel through the branch 19, when it is instantly taken up by the blast from the nozzle 14 and is projected by it into the interior of the kiln. Entering the kiln, the glazing material is dissipated by the blast in the form of a cloud, and instantly produces a vitrifying atmosphere that searches and permeates every corner of the kiln, thereby perfectly and evenly vitrifying the exposed surfaces of its contents. The oxygen which the blast contains assists the heat of the furnace or kiln in producing the necessary chemical action; but in order to facilitate the perfect formation of a glaze and color, as well as to maintain the temperature of the kiln against the influx of outside air, I contemplate the combining and commingling with the glazing material of suitable quantities of organic matter—such, for example, as anthracite or bituminous coal—in a pulverulent, semi-pulverulent, liquid, or other suitable form which, by their combustion, produce the required results.

The specific gravity of different glazing compositions varies materially. For that reason it is necessary to regulate the feed of the injector. That may be readily accomplished by the adjustment of the degree of insertion of the nozzle 14 into the body part 12 of the three-way fitting. A lock-nut 21^a may be provided on the outside of the fitting for fixing the nozzle in its required adjustment.

In a large kiln it may be desirable to inject the glazing material from a number of different points through the walls of the kiln. In order, therefore, that the apparatus may be operated from one point, I prefer to employ a single connecting-pipe 22, which may conform substantially to the shape of the kiln

and unite the different discharge-pipes together.

By causing the pipe 22 to intercept one discharge-pipe 11 transversely, as through a four-way fitting 24, and connecting the pipe 22 with auxiliary discharge-pipes 25 the injector may be operated and fed from one point. It is obvious, however, that the pipe 22 may be connected with the different discharge-pipes, so as to employ in connection with each discharge-pipe a separate supply-funnel for each pipe, if it is desired.

I do not desire to limit myself to the details of construction herein shown and described, but reserve the right to modify and vary them at will within the scope of my invention.

What I claim, broadly, is—

1. A glazing process, which consists in blasting into the interior of a kiln, maintained at a high temperature, a glaze producing chemical, substantially as set forth.

2. A glazing process, which consists in blasting into the interior of a kiln, maintained at high temperature, a compound of a glaze producing chemical and organic matter, substantially as set forth.

3. A glazing process which consists in injecting into the interior of a kiln maintained at a high temperature, a combustible and glaze producing blast, substantially as specified.

4. A glazing process which consists in injecting into the interior of a kiln maintained at a high temperature by direct communication with incandescent fuel beds, a combustible and glaze producing blast, substantially as specified.

5. The combination with a kiln and furnace bags, of a discharge pipe projecting into the kiln, and a protecting tunnel upon the bag adapted to protect the discharge pipe, substantially as specified.

In testimony of all which I have hereunto subscribed my name.

WILLIAM A. LONG.

Witnesses:

R. H. THOMPSON,
B. L. LONG.