

No. 762,742

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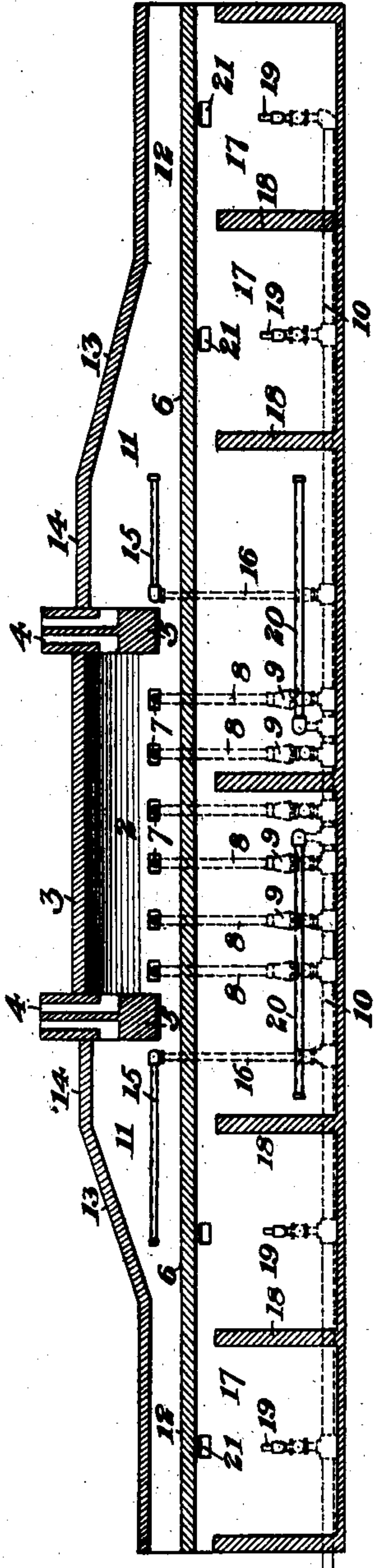
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LEER.

APPLICATION FILED NOV. 12, 1902.

NO MODEL.

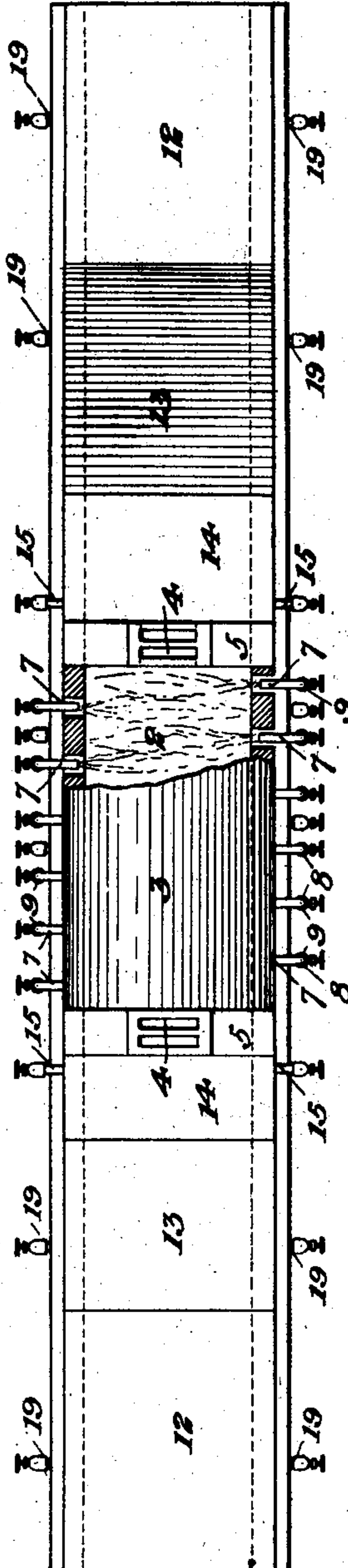
Fig. 1.



WITNESSES

L. A. Conner
J. W. Corwin

Fig. 2.



INVENTORS

Walter Mc Clintock
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their attys

UNITED STATES PATENT OFFICE.

WALTER McCLINTOCK, ELMER J. KRAUSE, AND DANIEL S. BEEBE, OF
BEAVER, PENNSYLVANIA, ASSIGNORS TO OPALITE TILE COMPANY,
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LEER.

SPECIFICATION forming part of Letters Patent No. 762,742, dated June 14, 1904.

Application filed November 12, 1902. Serial No. 130,973. (No model.)

To all whom it may concern:

Be it known that we, WALTER McCLINTOCK, ELMER J. KRAUSE, and DANIEL S. BEEBE, of Beaver, Beaver county, Pennsylvania, have
5 invented a new and useful Leer, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

10 Figure 1 is a longitudinal section of a glass-leer constructed in accordance with our invention; and Fig. 2 is a top plan view of the same, partly broken away.

Our invention relates to the class of glass-
15 leers for annealing, preparing, bending, decorating, or applying backing material to glass, opalite, or tile.

The object of the invention is to provide a leer which will act rapidly and efficiently and
20 which may be much shorter than the ordinary leer and, further, to improve the economy of the leer by economy in fuel and confining the heat at the desired point and to prevent breaking of the material.

25 In the drawings we show a leer adapted for applying backing material to opalite tile. In this operation the backing material and flux are applied to pieces of opaque glass and the glass then gradually raised in temperature
30 until the flux is melted and then annealed by passing through a gradually-decreasing temperature.

In the drawings, 2 represents the central and hottest chamber of the leer, this chamber
35 having an arched roof 3, extending transversely and provided with end outlet-flues 4, which extend through transverse partition-walls 5. These partition-walls extend down to a level as near the bottom of floor 6 of the
40 leer as will allow the articles to pass beneath them in and out of the chamber. This chamber is heated by a series of valved burners 7, which project through holes in the side walls on opposite sides. These burners are secured
45 at the ends of vertical pipes 8, having at their lower ends mixers 9, into which project gas-nozzles leading from a lower gas-supply pipe 10. We have found that by thus providing long

pipes, preferably about twenty-four inches in length, between the mixers and the burners 50 the combustion is greatly improved and the desired heat obtained with a small amount of gas. We have shown six burners upon each side, and the burners upon one side are staggered relative to those upon the other, so
55 that the horizontal flames projected across the chamber interlace or pass between each other, thus giving an extremely efficient heating action. The surplus heat of this chamber passes out through the flues 4, which may be provided
60 with suitable dampers, and also passes beneath the partitions into the other chambers of the leer. At each end of the central chamber are end chambers 11, which are provided with flat roofs or tops, which may be made of tile, stone, 65 or brick, the end portion 12 of the top being low and thence sloping up at 13 to the roof portion 14, which is at a considerably greater height than the portion 12. The sides of the chamber 11 may be formed of any suitable material, 70 and the flat bottom or floor of the leer 6 may be made either of refractory material—such as tiles, stone, or brick—or of iron or steel. In those portions of the chambers 11 which are
75 nearest the partition-walls 5 we provide burners 15, having supply-pipe 16, leading from the gas-main 10, and beneath the floor of the leer are chambers 17, having transverse partitions 18, which extend from the bottom up to a point near the leer-floor. The chambers 80 17 are provided with burners 19 and 20, which are connected to the gas-main 10, the burners 20 in the central and larger chambers being arranged to give greater heat than the burners for the outer chamber. The burners 19 85 and 20 are preferably arranged to project the flames upwardly against the bottom of the leer and to heat the same, so as to give a uniform heating action upon the glass. The waste gases from the chambers 17 may pass 90 out through upper side openings 21 and through the upper openings of the end partition.

In using the leer for backing tile the backing material with suitable flux is fed upon the 95 back of the glass plates or sheets, which are

then placed in pans or upon suitable carriers which are drawn through the leer. As the pans pass in under the low roof at one end they move through a gradually-increasing temperature, the heat being controlled by the sloping roof 13 and the outlet-flues of the central chamber. When the plates reach the central chamber, the flux is fused, thus securing the backing to the glass, and passing from the middle chamber they move on through a gradually-decreasing temperature, thus annealing them before they are taken out at the other end. The arched roof in the central chamber acts to throw down the heat and concentrate it along the central longitudinal axis of the chamber. This arched roof is not used in the outer chambers, since here it is desired to diffuse the heat and spread it evenly within the chambers and around the articles. If an arched roof were used in an outer chamber, it would be liable to crack the articles; but after the articles have passed through the outer chamber they are raised above the temperature at which they are liable to crack and then pass into the arched chamber, where the heat is deflected and concentrated upon them. A sloped roof in the outer chamber is used to gradually increase the height of the chamber and throw the heat toward the arched chamber. In this outer chamber as the roof goes higher the temperature becomes higher until it reaches nearly that of the central chamber, thus gradually preparing the article and preventing any sudden change of temperature as it enters the central chamber. The flat roof of the outer chamber diffuses the heat evenly, and the heat in all the chambers may be controlled by means of the outlet-flues within the partitions. These flues are normally closed; but by opening the valve in one of them the heat may pass out from the connected chamber to decrease the temperature therein.

In burning decorations upon glass the operation will be substantially the same as in applying backing. In using the leer for preparing glass for bending the leer is the same as above shown except that one of the end chambers 11 is done away with and the glass is fed in from the cool end and after passing through the chamber 2 the glass is placed in the molds. In using the leer for the ordinary annealing of glass—such as shapes, pieces of sheet-glass which have been flattened on a flattening-stone—one of the end chambers is

removed and the glass enters the chamber 2 directly from the flattening-stone and passes thence through the gradually-decreasing heat of the end chamber 11. 55

The advantages of our invention result from the simplicity of the construction, which gives economy both in construction and operation. The arrangement of the leer-chambers confines the heat, and the arrangement of the burners gives a sharp and intense heat with a small amount of fuel. The sloping roof aids in controlling the heat, and the staggered arrangement of the burners gives a substantially unbroken sheet of flame above the glass. The lower burners below the leer-bottom aid in heating the glass equally and preventing breakage. 60 65 70

Many variations may be made in the form and arrangement of the leer, the burners, partitions, &c., without departing from our invention. 75

We claim—

1. A leer having a heating-chamber with an arched roof, a cooling-chamber with the outer portion of its roof lower than that of the heating-chamber, and a partition partially separating the two chambers; substantially as described. 80

2. A leer having a heating-chamber with a transversely-arched roof, a cooling-chamber at its end with a flat roof sloping downwardly from the inner end toward its outer end, and a partition partially separating the chamber; substantially as described. 85

3. A leer having a heating-chamber, and a transversely-arched roof, and end partition-walls provided with outlet-flues, burners extending through the sides of said chamber, and a cooling-chamber beyond one of the partitions having a flat downwardly-sloping roof; substantially as described. 90 95

4. A leer having a chamber beneath its floor, with transverse partitions, and heating-burners in the different chambers thus formed; substantially as described.

In testimony whereof we have hereunto set our hands. 100

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Witnesses:

ALICE CARNER,
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