

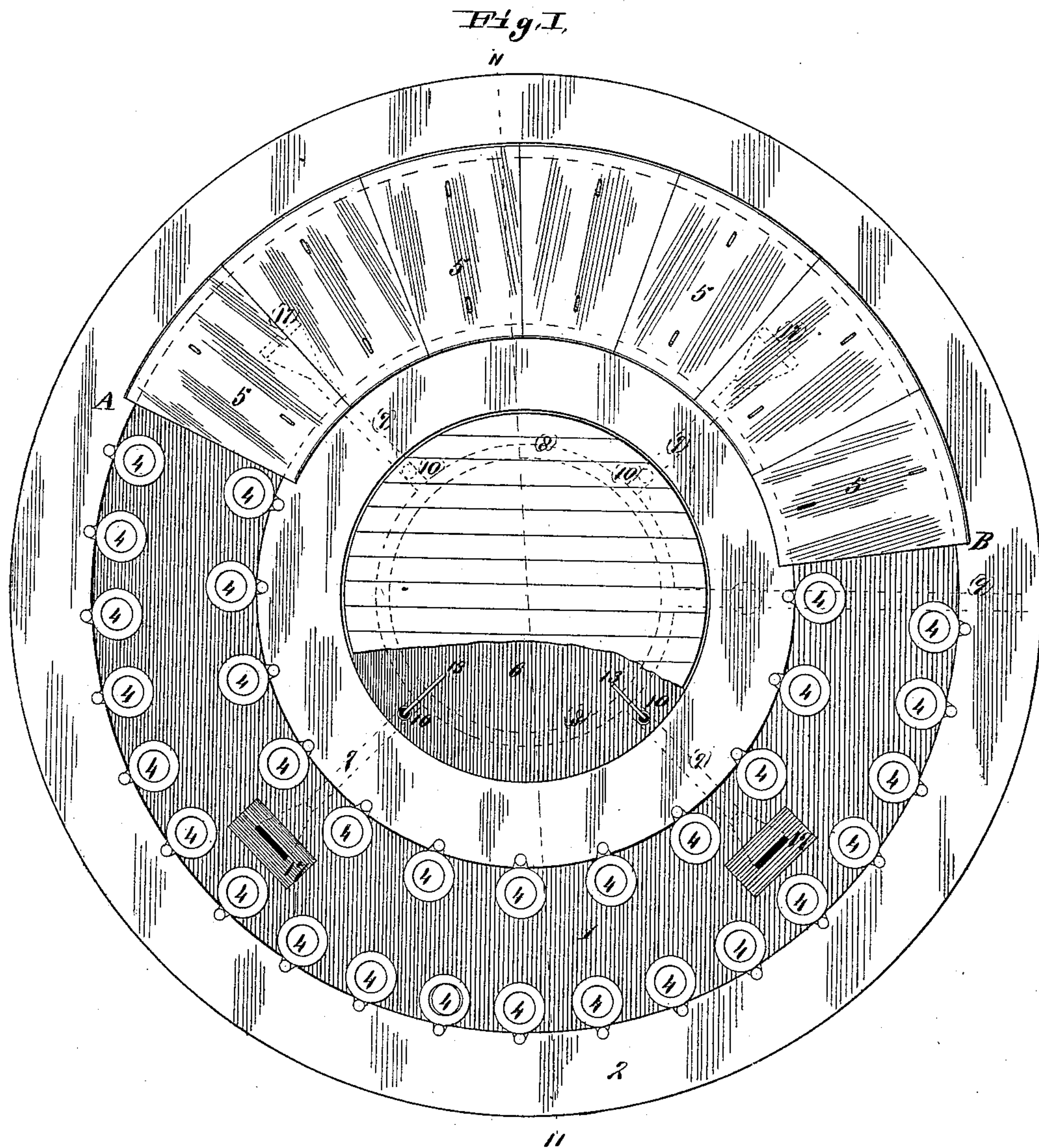
(No Model.)

2 Sheets—Sheet 1.

P. McARTHUR.  
MOLD DRYING APPARATUS.

No. 434,833.

Patented Aug. 19, 1890.



Attest,  
P. McArthur  
S. H. Knight.

Inventor,  
Peter M. Arthur  
By Knight Bros  
Atty's

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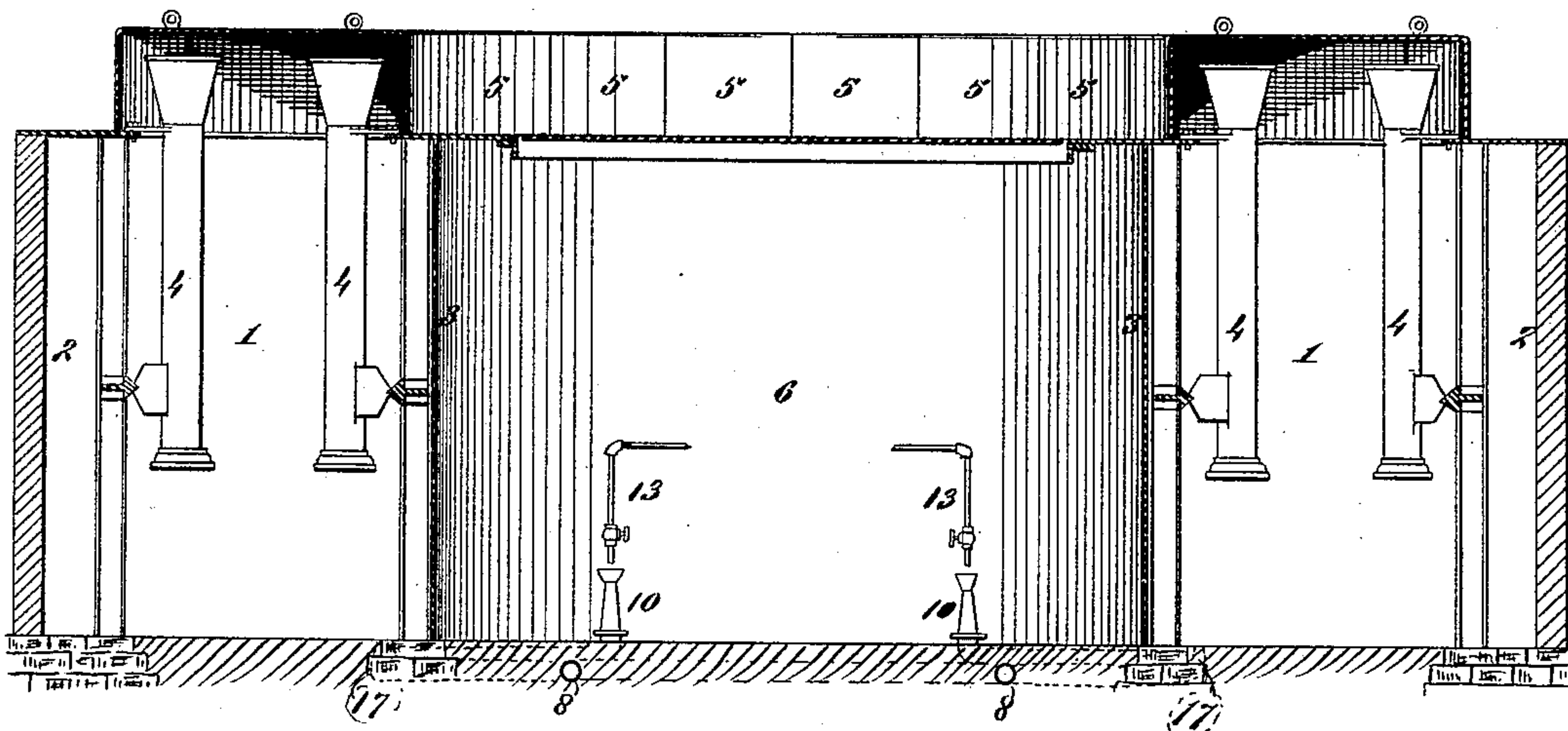
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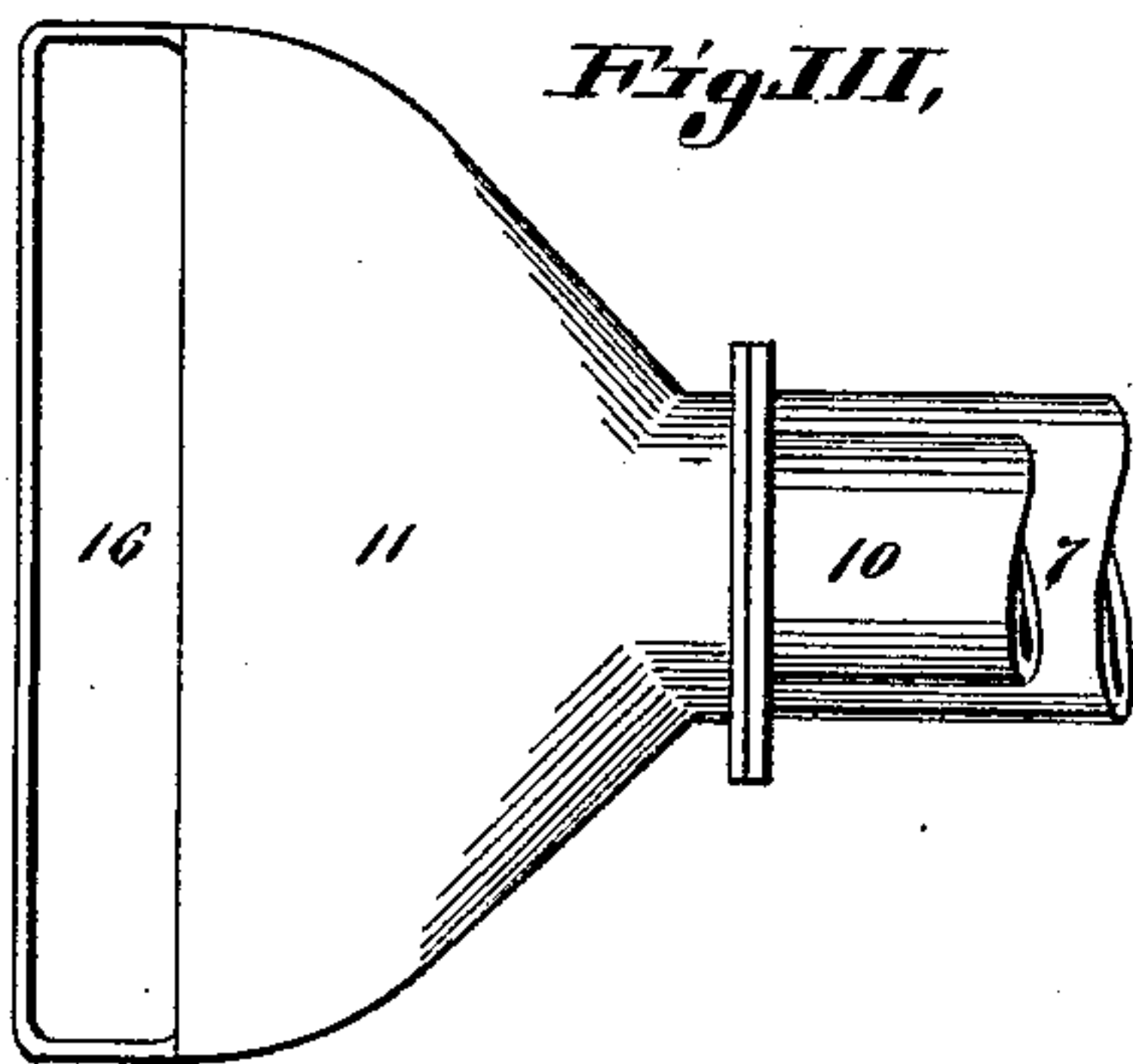
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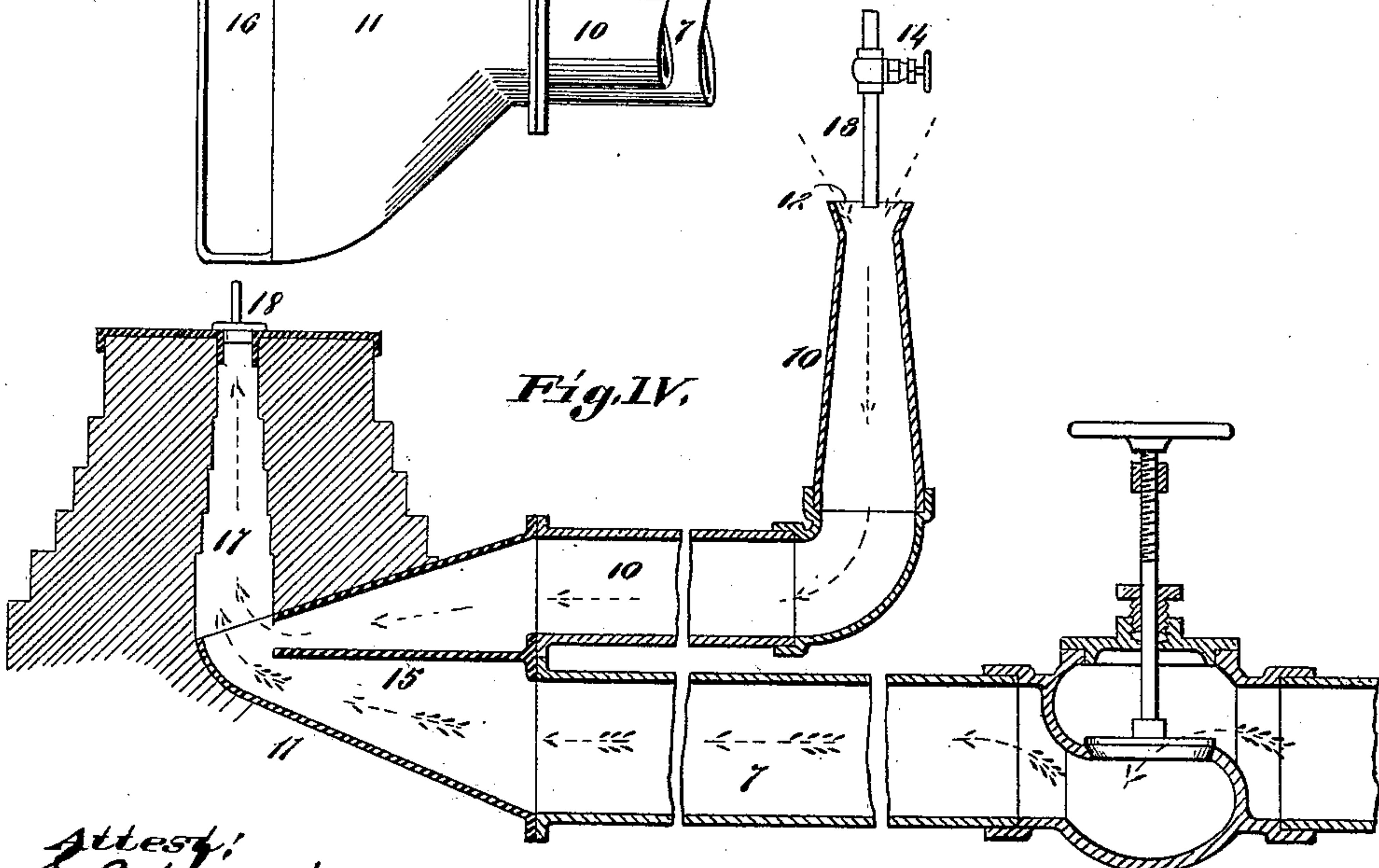
*Fig. II,*



*Fig. III,*



*Fig. IV,*



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# UNITED STATES PATENT OFFICE.

PETER MCARTHUR, OF ST. LOUIS, MISSOURI, ASSIGNOR OF TWO-THIRDS TO  
THOMAS HOWARD AND JOHN W. HARRISON, BOTH OF SAME PLACE.

## MOLD-DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 434,833, dated August 19, 1890.

Application filed November 4, 1889. Serial No. 329,159. (No model.)

*To all whom it may concern:*

Be it known that I, PETER MCARTHUR, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Apparatus for Drying Molds in the Manufacture of Cast-Iron Pipes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to an improved apparatus for drying molds in the manufacture or production of gas-pipes, water-pipes, and the like; and my invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a top or plan view of a pit, showing a number of flasks located therein and illustrative of my invention. Fig. II is a vertical section taken on line II II, Fig. I. Fig. III is an enlarged view of one of the nozzles of the conducting-tubes, and Fig. IV is an enlarged detail section of the nozzles and conducting-tubes and through one of the flues or ducts into which the nozzle discharges.

It has long been the practice in the manufacture of cast-iron pipes to remove the flasks to a drying-oven after the molds have been formed and the patterns removed. It has also been common to reserve a portion of the pit—as, for instance, the portion indicated between the letters A B, Fig. I—for such purpose, and the flasks are moved from their supports to this oven by means of a suitable crane.

It will be understood, of course, that after the molds have been formed by ramming sand in a space between the patterns and the inside walls of the flasks these molds thus formed have to be dried, and, as stated, it has been the practice to move the flasks after the patterns are withdrawn to an oven for this purpose. There are many objections to this method, among which may be mentioned the cost of moving these heavy flasks and the accidents incident thereto, largely resulting from the fact that it is practically impossible to swing these flasks and set them down in the oven without their coming against each other or against the walls of the pit.

Any jar of this kind is liable to crack the mold, particularly at the joints of the flasks,

the molds of course not yet having been dried and hardened, the result being that a faulty pipe will be produced. By a long practical experience these difficulties have proven themselves to be of very serious importance in the manufacture of cast-iron pipes in this well-known method. I seek to and do overcome these difficulties by a method of drying the flasks without removing them from their supports, thus avoiding the expense of handling them and the accidents incident thereto. It has heretofore been proposed to dry the molds without removing the flasks from their supports; but so far as I am aware all efforts heretofore have proved to be failures.

Referring to the drawings, 1 represents a pit which I have shown circular in form, but which may of course be of any desired shape. This pit is formed by an outer wall 2 and an inner wall 3.

4 represents the flasks, located in the pit and supported from the walls by any suitable method.

My present invention does not relate to the manner of supporting the flasks.

I have shown two rows or series of flasks, one row or series being supported at the outer wall 2 and the other row or series being supported at the inner wall 3. During the drying process the pit is designed to be covered at top by means of a sectional hood 5, which covers the flasks, and which is of course removed during the ramming process and when the patterns are being inserted and taken out, and while the cores are being inserted, the cores and patterns being handled in any suitable way—as, for instance, by means of a crane supported in the central chamber 6 within the wall 3. After the ramming is done and the patterns removed the molds are ready to be dried, and the hood 5 is placed over the pit 1 and flasks 4, and remains there during the drying process, as stated.

7 represents gas-pipes, which I have shown as radiating from a circular pipe 8, which is supplied with gas from the main pipe 9.

10 represents combined air and steam pipes communicating with a nozzle 11, with which the pipes 7 also communicate, as shown clearly in Figs. III and IV. The up-



per ends of the pipes 10 are open, as shown at 12, Fig. IV, for the introduction of air.

13 represents steam or compressed-air pipes provided with valves 14, and which discharge into the pipes 10. The nozzles 11 are preferably provided with a dividing-diaphragm 15, which keeps the air and steam from commingling with the gas until the discharge end of the nozzle is reached. The discharge end of the nozzle has, preferably, an elongated opening 16, through which the mingled gas, air, and steam escapes into a flue or duct 17, which discharges into the lower part of the pit 1, as shown in Fig. I. It will be understood that there is a flue or duct 17 for each nozzle 11, and that there is a nozzle for each set of pipes 7 and 10, as shown by dotted lines in Fig. I. The upper ends of the ducts or flues 17 may be closed, except when the drying is going on, by means of plugs 18, for the purpose of excluding sand and dirt.

By covering the pit and flasks and using a fuel of the kind described I am enabled to dry the flasks in position at a very small expense, and when it would be practically impossible to do it if the hood did not inclose flasks, and it would be very difficult to do it by the use of other fuels requiring combustion-chambers, ash-pits, draft-flues, and the like, and moreover I accomplish a forced upward draft of the heat through the pit, which results in carrying the dampness upward and away from the flasks, it being understood that while the pit is inclosed by the hood 5, so as to retain the greater proportion of heat and cause it to pass evenly through and around the flasks, yet there is sufficient space

between the sections of the hood to permit of the necessary upward circulation of the heat. The point of ignition of the gas and air is at the exit end of the ducts or flues 17. With an arrangement of this kind the flasks are dried without moving them from their supports, which results in a very great saving of labor and expense, as already stated.

I claim as my invention—

1. The improved apparatus for drying molds, consisting of a covered pit inclosing the flasks, gas, air, and steam or compressed-air pipes, and flues or ducts into which the pipes discharge, whereby a free circulation of heat from the flues through and around said flasks from bottom to top of the pit is permitted, substantially as set forth.

2. The improved apparatus for drying molds, consisting of a casting-pit inclosing the flasks, pipes for conducting heat to the bottom of said casting-pit, and a covering for said pit above the top of said flasks, whereby a free circulation of heat through and around said flasks from bottom to top of the pit is permitted, substantially as set forth.

3. The combination of a pit for containing the flasks, gas, air, and steam or compressed-air pipes, a nozzle with which said pipes communicate and which is provided with a partition, a flue or duct communicating freely with the entire open space of the pit and into which flue or duct the pipes discharge, and a hood covering the pit, substantially as and for the purpose set forth.

PETER MCARTHUR.

In presence of—

GEO. H. KNIGHT,  
E. S. KNIGHT.