

C. BERHENKE.  
APPARATUS FOR DRYING BRICKS, &c.

APPLICATION FILED NOV. 6, 1901.

NO MODEL.

2 SHEETS—SHEET 1.

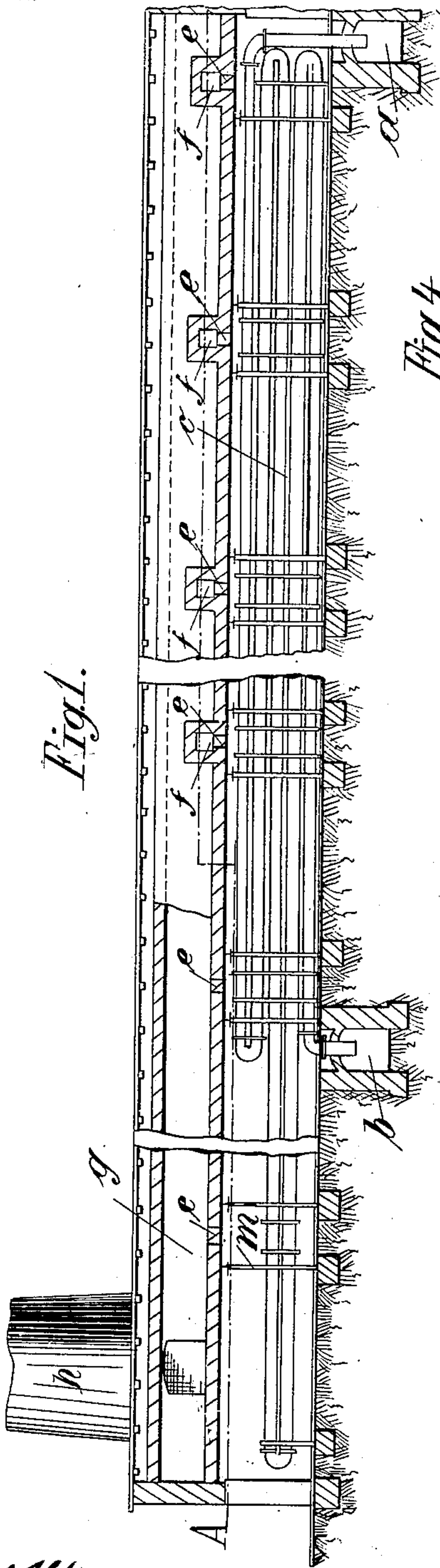


Fig. 1.

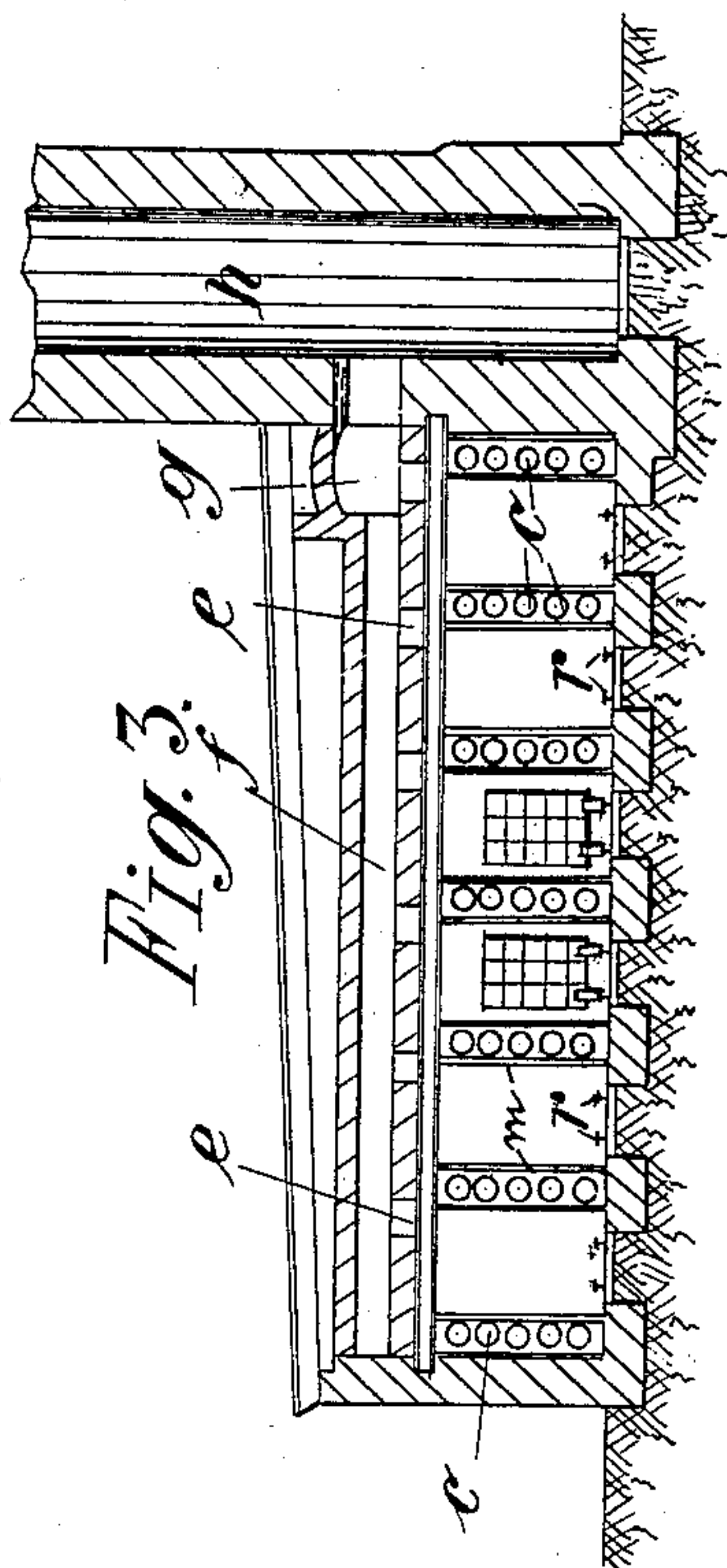


Fig. 3.

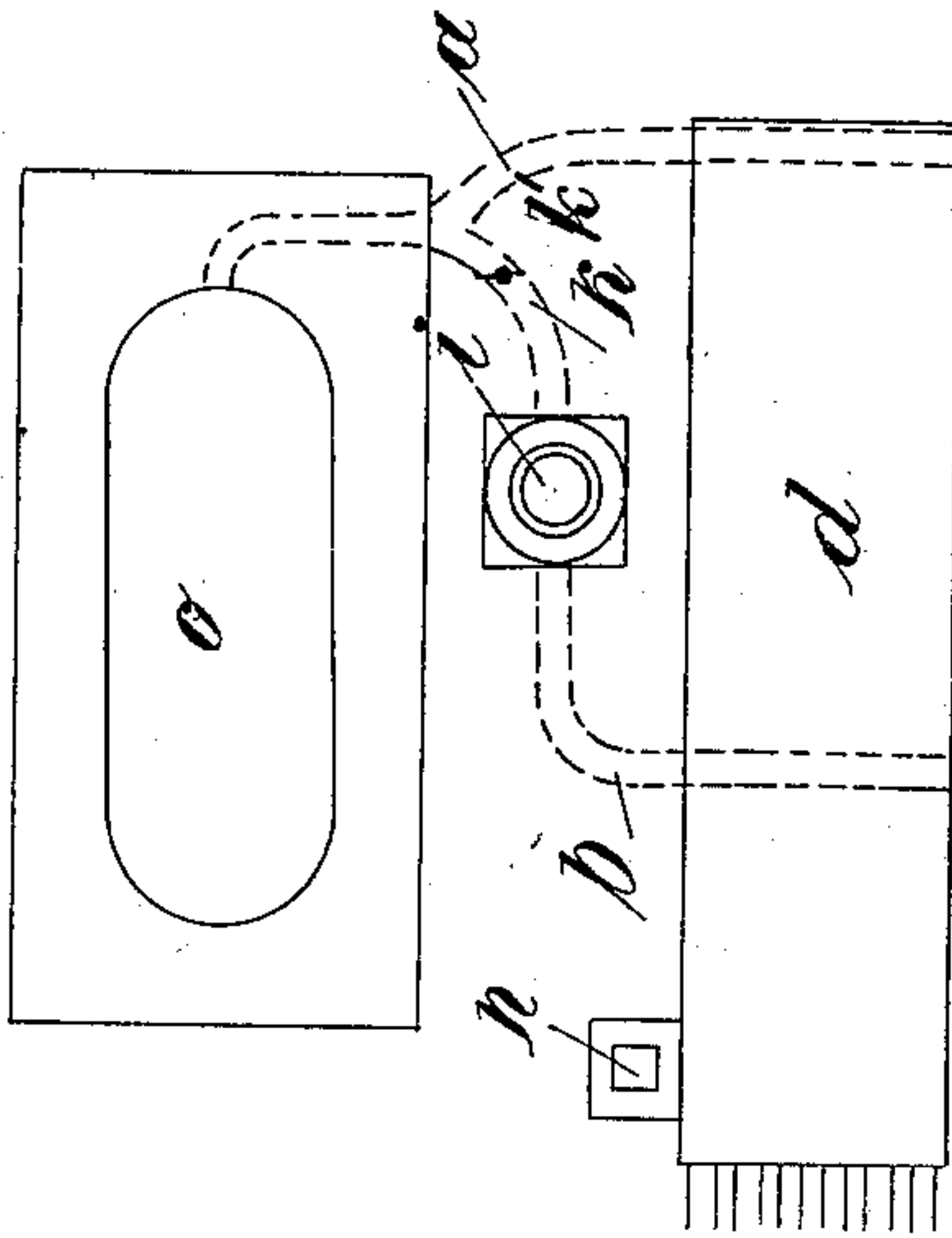


Fig. 4.

Witnesses.  
J. Green  
W. F. Hammond

Inventor  
Carl Berhenke  
by Knight Bros. atty

C. BERHENKE.

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2 SHEETS—SHEET 2.

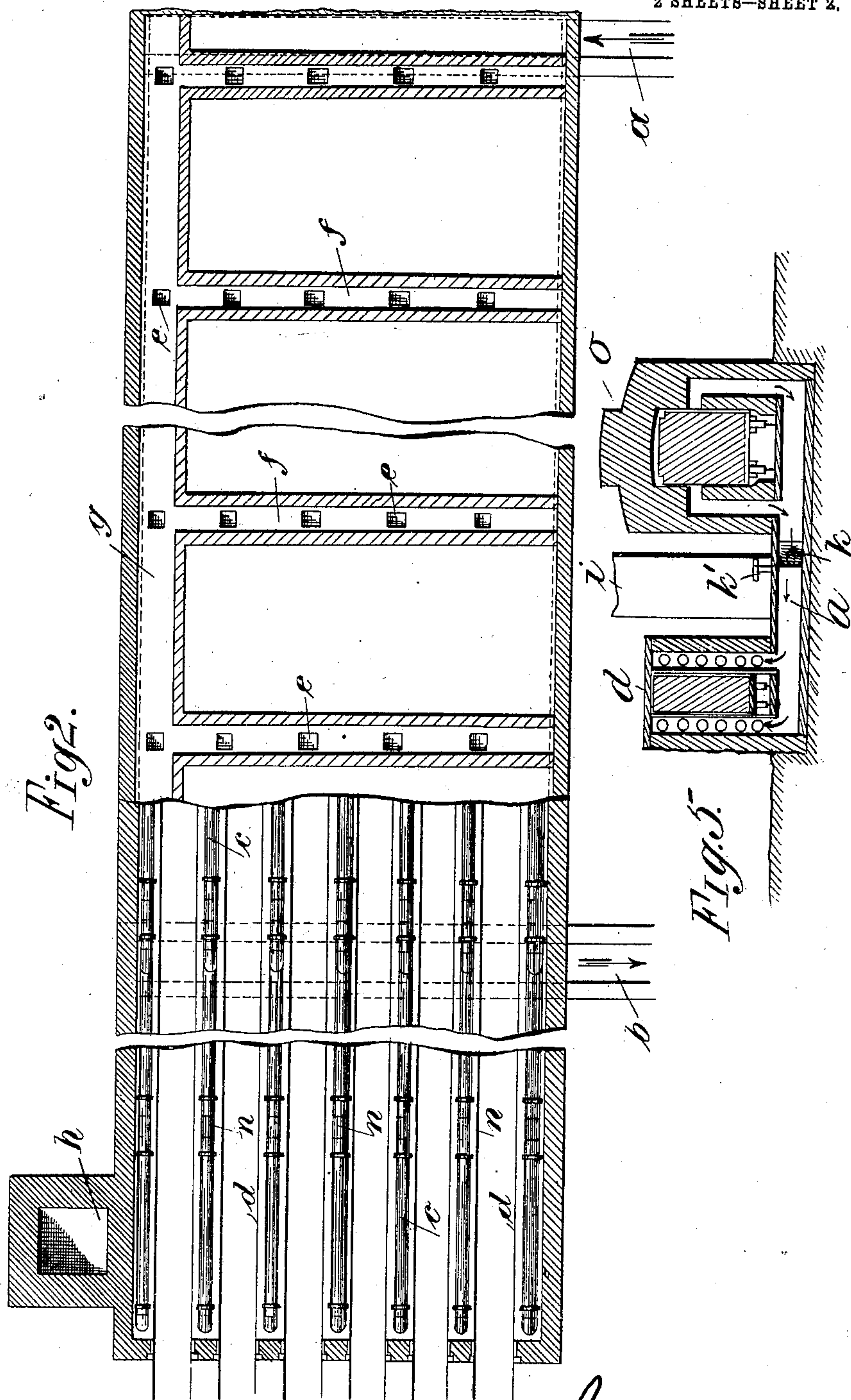


Fig. 5.

Witnesses:  
J. Green  
N<sup>th</sup> P. Hammond

Inventor  
Carl Burkhardt  
by Knight Bros. Attys



# UNITED STATES PATENT OFFICE.

CARL BERHENKE, OF BILLERBECK, GERMANY.

## APPARATUS FOR DRYING BRICKS, &c.

SPECIFICATION forming part of Letters Patent No. 736,060, dated August 11, 1903.

Application filed November 6, 1901. Serial No. 81,358. (No model.)

*To all whom it may concern:*

Be it known that I, CARL BERHENKE, a subject of the Prince of Lippe, residing at Billerbeck, Lippe, Germany, have invented certain new and useful Improvements in Drying Apparatus for Bricks, Tiles, and the Like, of which the following is a specification.

My invention relates to improvements in means for the drying of bricks, tiles, and other ceramic ware. The essentially new and characteristic feature lies in place of using a special direct heating source for the drying-chamber in drying the bricks or the like piled up in the latter by the warmth contained in the waste gases from a kiln. The moisture hereby drawn off from the ware in drying as also the waste gases may then be led away to the furnace-chimney. The otherwise lost warmth of the waste gases which serve the purpose of drying is under my invention rationally employed with the same special heating of the drying-chamber, which formerly required a special heating source for this alone or steam-pipes from a steam-supply station.

In carrying out my invention I lay in some known way through the usual drying-chamber a system of pipes, which latter is connected to the exit for the hot combustion-gases rising from the kiln and which led through the pipes impart their heat to the piled-up bricks or other ware to be dried. The water-vapors arising are led off through openings distributed over the roof of the drying-chamber and which are connected with channels conducting the gases to a chimney.

In the accompanying drawings, which illustrate my invention, Figure 1 is a longitudinal sectional elevation of the brick-drying plant; Fig. 2, a plan, partly in horizontal section, on the line A B of Fig. 1. Fig. 3 shows a transverse section, and Fig. 4 shows in a ground plan, the relative positions of the kiln and the plant. Fig. 5 is a diagrammatic end view of the apparatus.

A large number of pipe-coils *c* are led through the drying-chamber *d*, which is itself of a known form. These coils terminate at one end in a duct *a*, connected with the top of the kiln *o*, and at the other end in a channel *b*, leading to the chimney *i*. The chimney *i* is connected with a duct *a* before entrance of the latter to the drying-chamber by

means of a branch channel *k*, which latter can be wholly or partially shut by means of a damper *k'* or other device in order to regulate the quantity of the gases passing through the pipe-coils *c*, according to requirement. Several rows of apertures *e* are formed in the roof, terminating in channels *f*, which run transversely of the drying-chamber and discharge into a longitudinal canal *g*, connected with the chimney *h*.

In carrying out my invention the operation is as follows: The hot combustion-gases pass through the channel *a* to the different coils of pipes, then through all these and through the channel *b* to the chimney *i*. The heat radiated from the pipes vaporizes the water contained in the tiles in process of being dried, and the vapors pass through the openings and connecting-channels *f* and *g* to the chimney *h*. Should only a portion of the gases be used for heating or the process be stopped, the passage for the combustion-gases through the branch channel *k* is wholly or partially opened.

The various pipes *c* may be led parallel to one another longitudinally throughout the drying-chamber *d*, as is shown in the drawings. They are supported at suitable intervals by column-shaped frames *m*, which at the same times support the roof of the chamber. The pipe-coils *c* consist, preferably, of long tubes, between which short pieces *n* and bent connecting-pieces are coupled by means of flanged joints to enable ready cleaning of soot adhering to the pipes and removal, if necessary. Throughout the chamber rails *r* run between the pipes, as already known, in order to carry in the bricks to be dried in small trucks and in the same way to remove them after drying.

The improvements in the drying of bricks herein described present the following advantages: A separate heating source for the drying-channels is not required, effecting the saving of a very considerable sum, depending, naturally, on the price of coal, but always considerable. A saving of work is also obtained, because the bricks can be led in on the trucks and after drying can be removed directly to the kilns. Under my invention where hot gases are employed direct a higher economic coefficient is obtained than in those



drying plants where steam is the drying agent.

My apparatus differs in principle from others in which waste heat from cooling off kilns is carried to the drying-rooms by direct circulation of air. In my apparatus I employ the gases from the kiln which are usually discharged into the chimney. By conducting these waste gases through a drying-channel and radiating-pipes by which heat is supplied to the drying-chambers and then discharging them into the chimney I am enabled with the greatest efficiency and economy to make the one chimney serve for the kiln and the drying apparatus while maintaining the very unequal degree of heat in the two and dispense with the necessity of direct firing or steam-heating or other special source of heat commonly employed in drying apparatus. The simplicity of the apparatus reduces cost of attendance, and I furthermore provide effective means for graduating and regulating the heat in the driers and also for carrying off discharged vapor.

The following is what I claim as new and desire to secure by Letters Patent:

1. A drying apparatus comprising a drying-chamber, having a roof provided with apertures, transverse channels, located over the apertures, a longitudinal canal with which the channels connect, a chimney with which the canal connects, a kiln, a kiln-chimney located between the drying-chamber and the

kiln, an inlet-duct conveying the products of combustion from the top of the kiln to the base of the drying-chamber, an outlet-channel conveying the products of combustion from the base of the drying-chamber to the kiln-chimney, and pipe-coils located in the drying-chamber having one end connected with the inlet-duct and the other end connected with the outlet-channel.

2. A drying apparatus comprising a drying-chamber, having a roof provided with apertures, transverse channels, located over the apertures, a longitudinal canal with which the channels connect, a chimney with which the canal connects a kiln, a kiln-chimney located between the drying-chamber and the kiln, an inlet-duct conveying the products of combustion from the top of the kiln to the base of the drying-chamber, having a branch provided with a damper and connected with the kiln-chimney, an outlet-channel conveying the products of combustion from the base of the drying-chamber to the kiln-chimney, and pipe-coils located in the drying-chamber having one end connected with the inlet-duct and the other end connected with the outlet-channel.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

CARL BERHENKE.

Witnesses:

CARL SCHMITT,  
CHARLES LESIMPLE.