(No Model.) 7 Sheets—Sheet 1.

T. L. MYERS.

BRICK KILN.

No. 577,928. Patented Mar. 2, 1897.

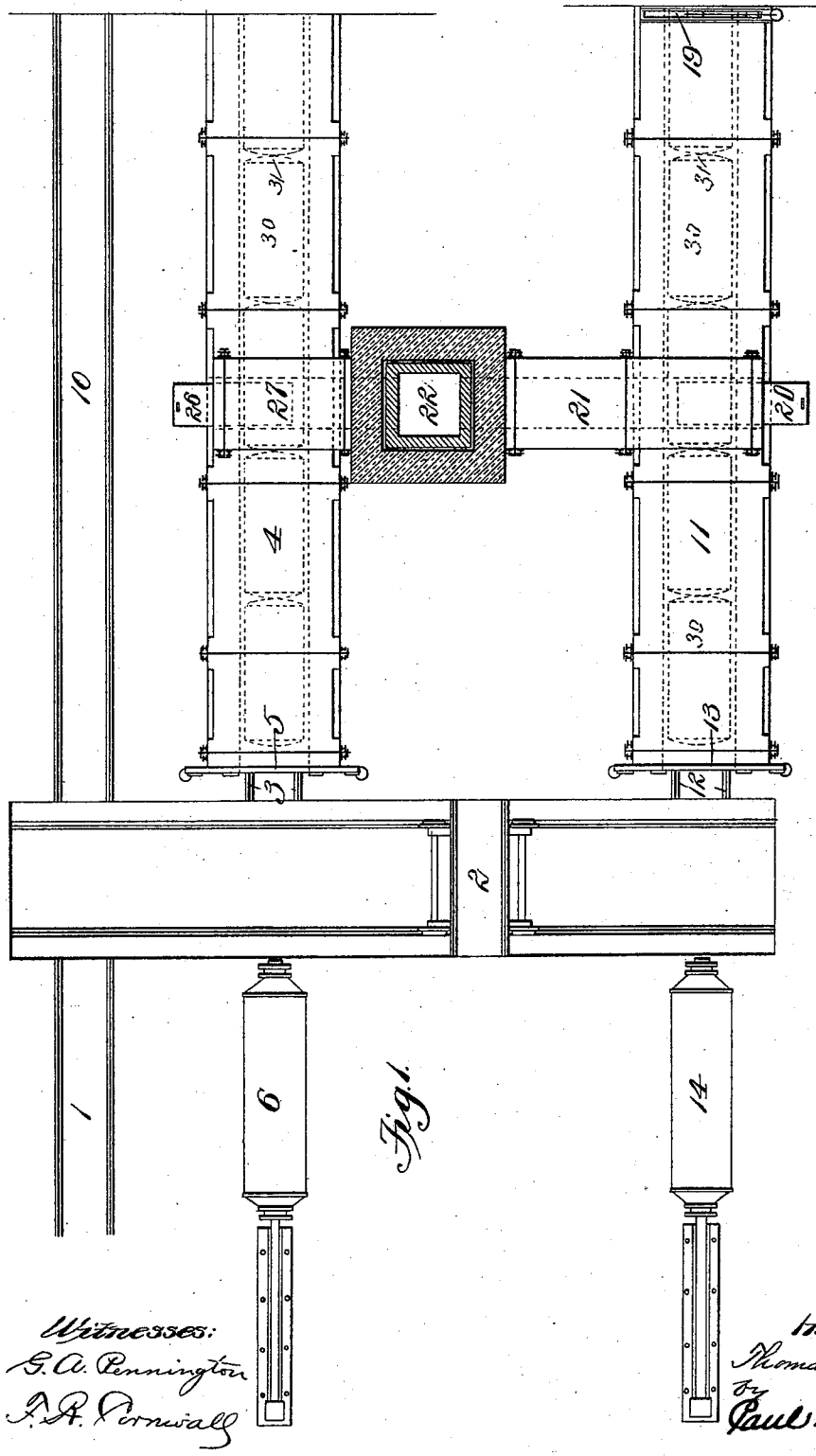

Fig. 1.

Witnesses:
G. A. Pennington
F. A. Tornwall

Inventor:
Thomas L. Myers
By Paul Bakewell
his atty.

(No Model.) 7 Sheets—Sheet 2.

T. L. MYERS.

BRICK KILN.

No. 577,928. Patented Mar. 2, 1897.

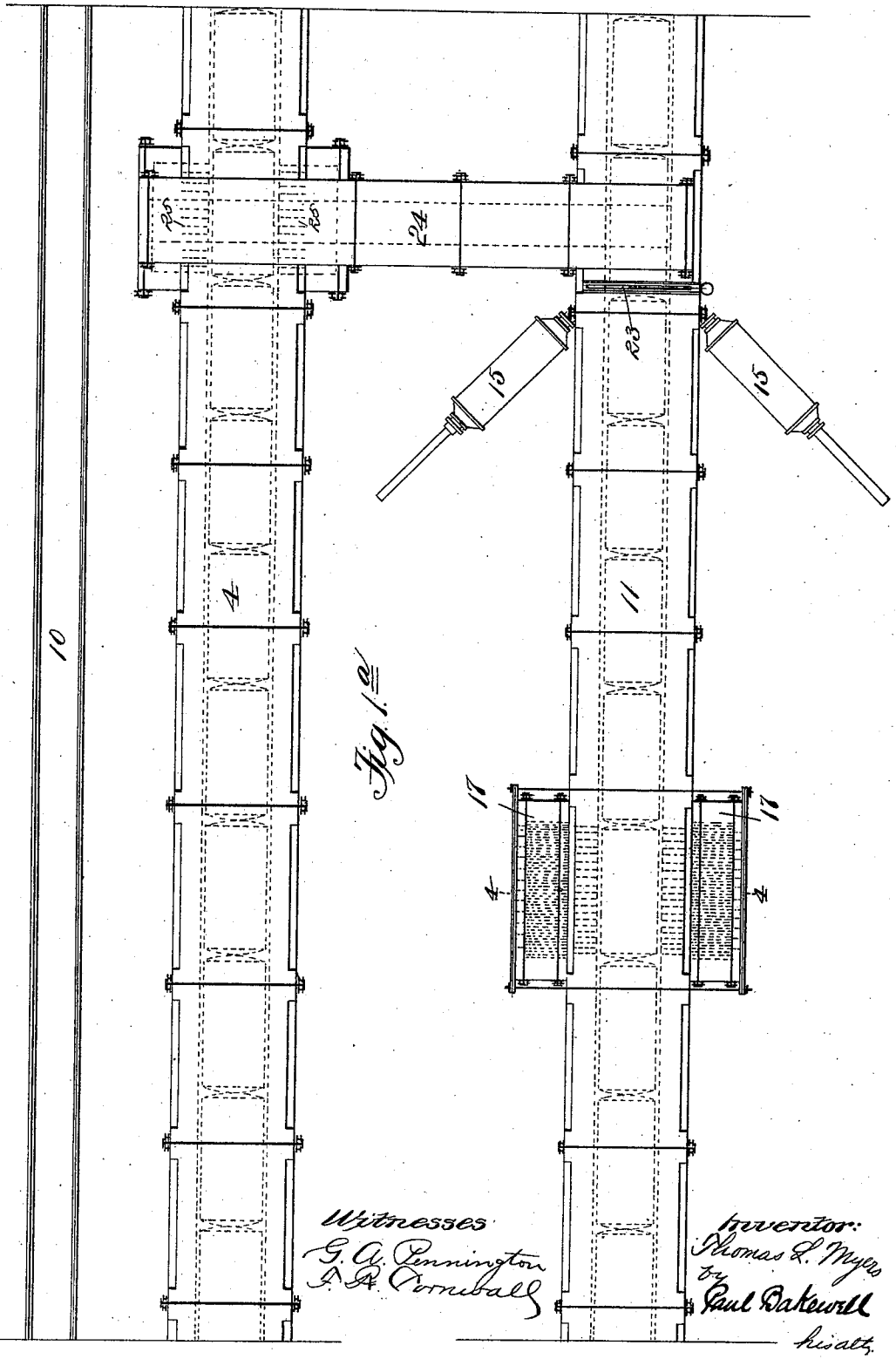

Fig. 1.

Witnesses
G. A. Pennington
F. A. Crandall

Inventor:
Thomas L. Myers
by Paul Bakewell
his atty.

(No Model.) 7 Sheets—Sheet 3.

T. L. MYERS.

BRICK KILN.

No. 577,928. Patented Mar. 2, 1897.

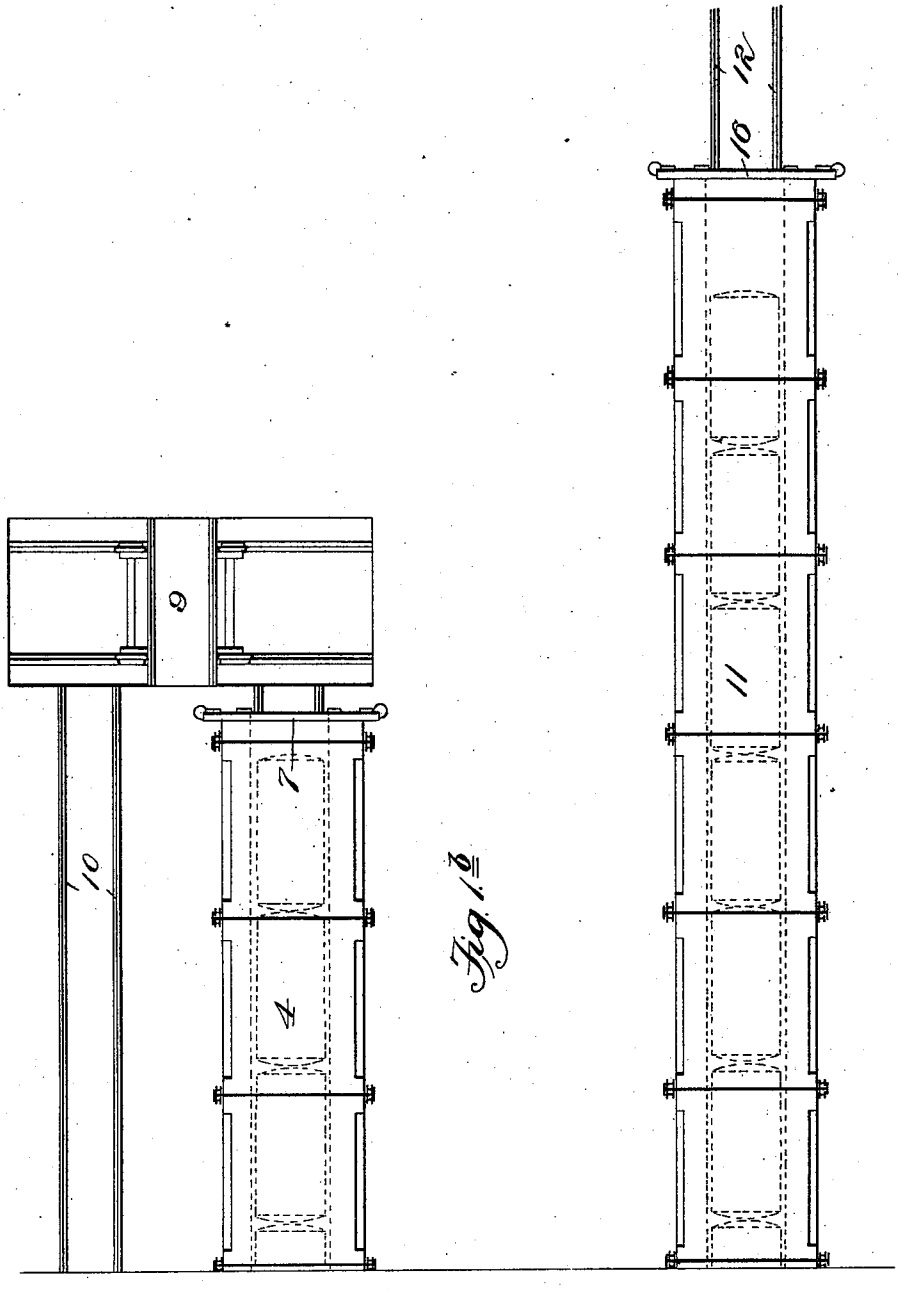

Fig. 1.

Witnesses:
G. A. Pennington
T. A. Conwall

Inventor:
Thomas L. Myers
by Paul Bakewell
his atty.

(No Model.)

7 Sheets—Sheet 4.

T. L. MYERS.

BRICK KILN.

No. 577,928. Patented Mar. 2, 1897.

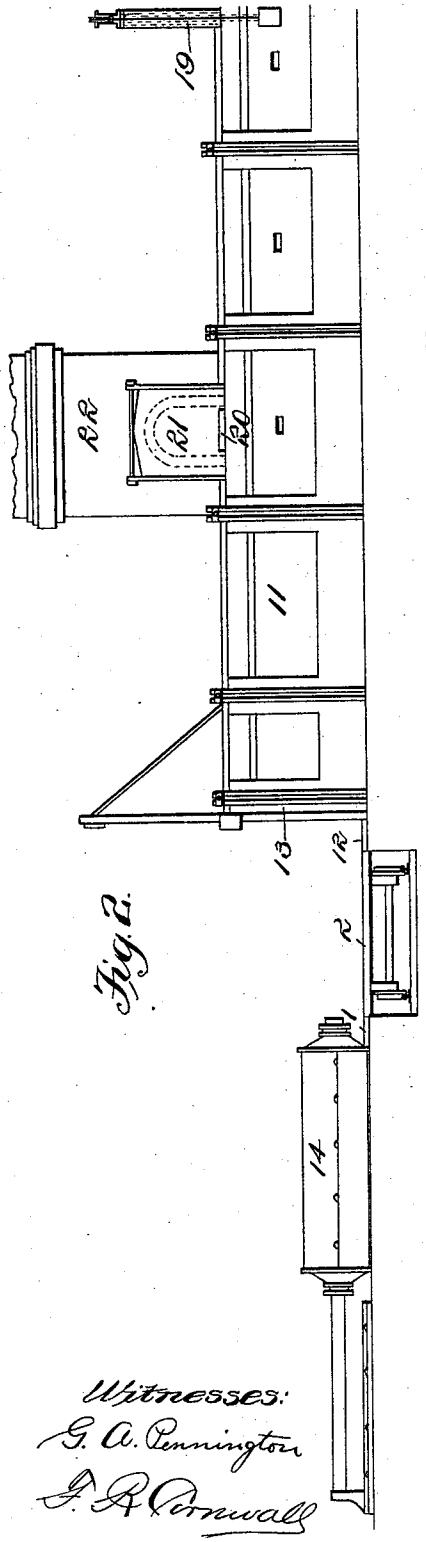

Fig. 2.

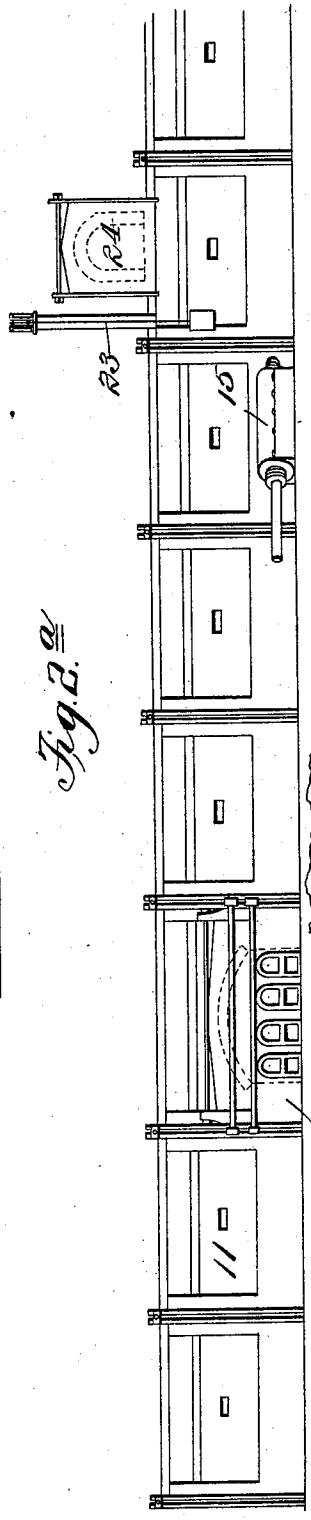

Fig. 2a.

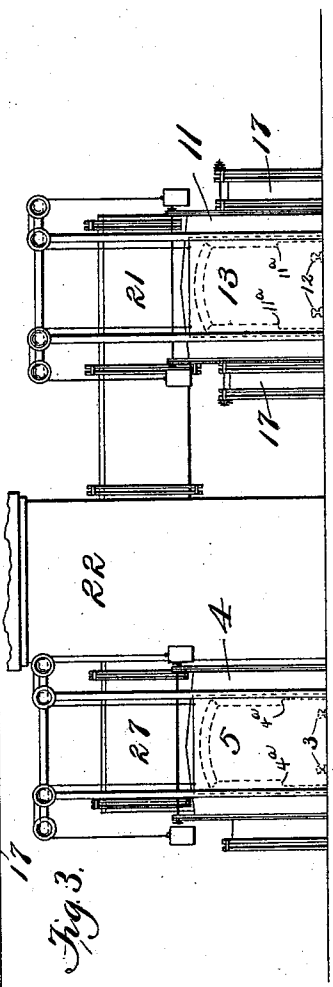

Fig. 3.

Witnesses:
G. A. Pennington
F. R. Cornwall

Inventor:
Thomas L. Myers
by Paul Bakewell
his atty.

(No Model.) 7 Sheets—Sheet 5.

T. L. MYERS.

BRICK KILN.

No. 577,928. Patented Mar. 2, 1897.

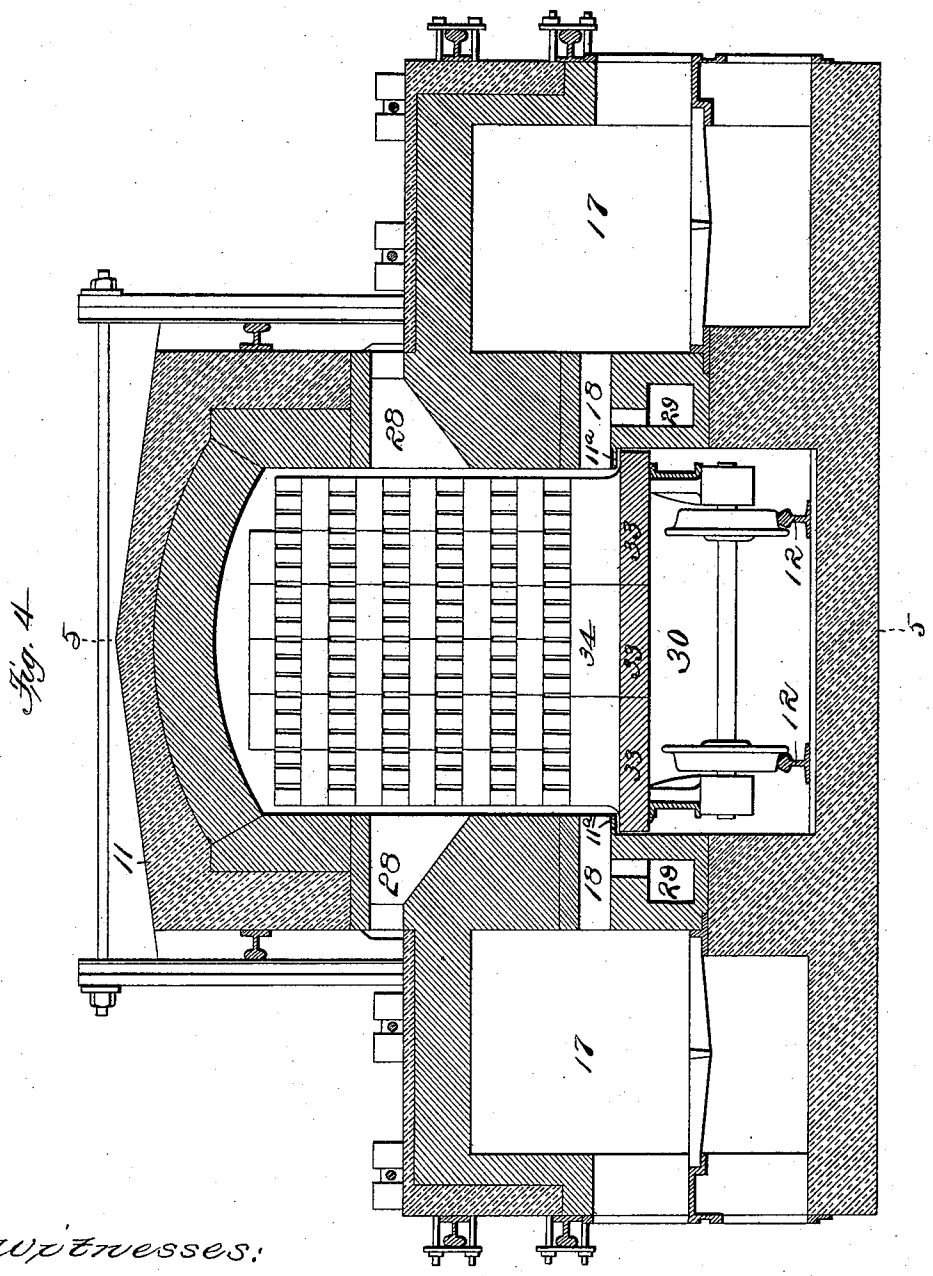

Fig. 4.

Witnesses:
G. A. Pennington
F. A. Cornwall

Inventor:
Thomas L. Myers
by Paul Bakewell
his atty

(No Model.)

7 Sheets—Sheet 6.

T. L. MYERS.

BRICK KILN.

No. 577,928. Patented Mar. 2, 1897.

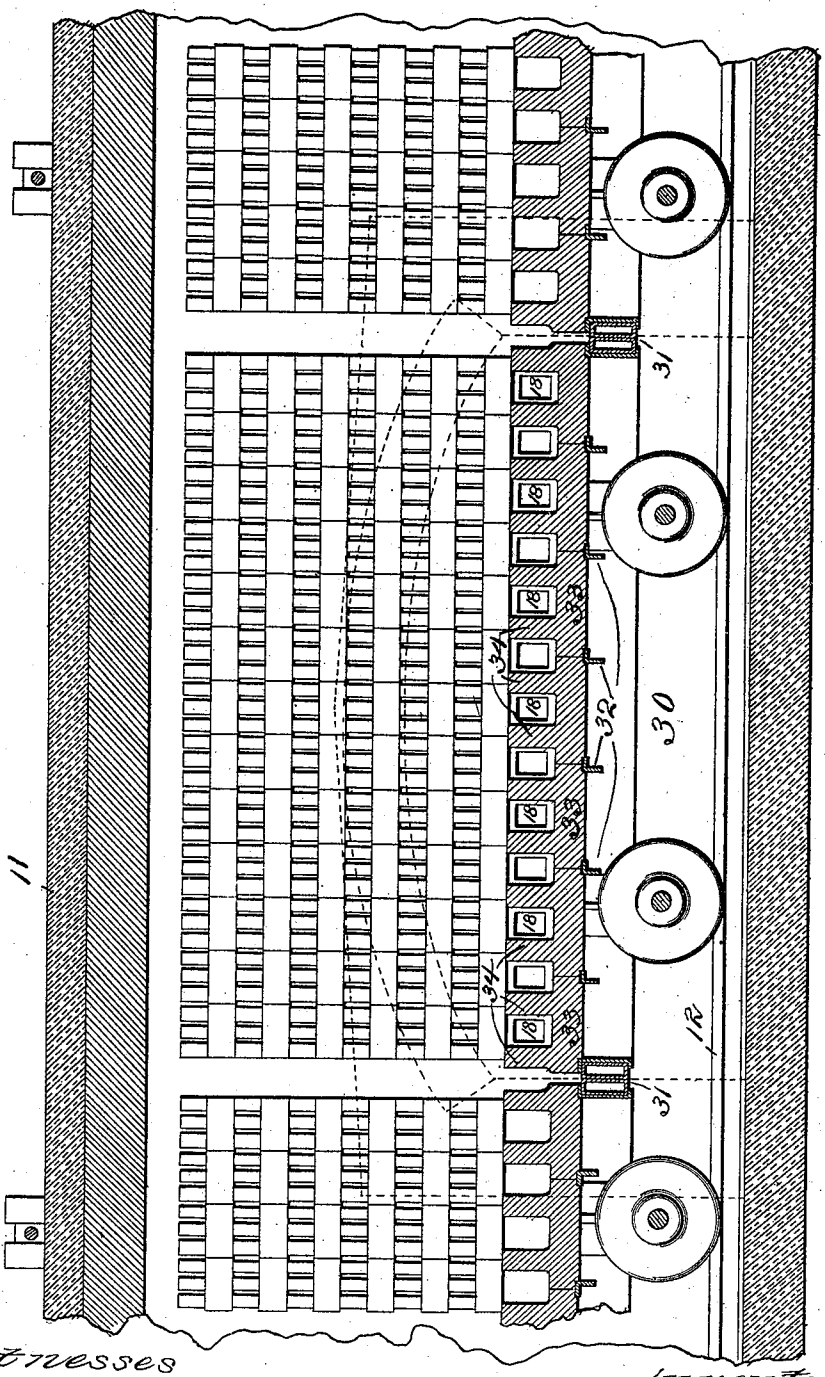

Fig. 5.

Witnesses
G. A. Pennington
P. R. Cornwall

Inventor:
Thomas L. Myers
by Paul Bakewell
his atty.

(No Model.) 7 Sheets—Sheet 7.

T. L. MYERS

BRICK KILN.

No. 577,928. Patented Mar. 2, 1897.

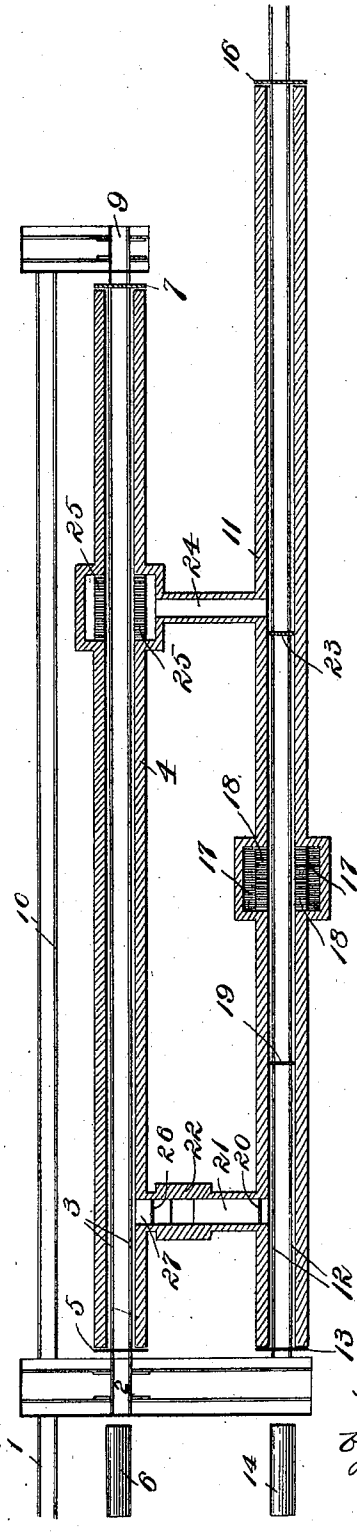

Fig. 6.

Witnesses:
G. A. Pennington
F. R. Cornwall

Inventor:
Thomas L. Myers
by Paul Bakewell
his atty.

UNITED STATES PATENT OFFICE.

THOMAS L. MYERS, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE FERNHOLTZ BRICK-PRESS COMPANY, OF SAME PLACE.

BRICK-KILN.

SPECIFICATION forming part of Letters Patent No. 577,928, dated March 2, 1897.

Application filed July 15, 1896. Serial No. 599,231. (No model.)

To all whom it may concern:

Be it known that I, THOMAS L. MYERS, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Brick-Kilns, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figures 1, 1^a, and 1^b represent a plan view of my improved kiln, said views being on different sheets on account of the length of the kiln, but showing practically an entire kiln. Fig. 2 is a side elevational view of that part of the kiln shown in Fig. 1. Fig. 2^a is a side elevational view of that part of the kiln shown in Fig. 1^a. Fig. 3 is an end elevational view of the kiln. Fig. 4 is an enlarged cross-sectional view on line 4 4, Fig. 1^a. Fig. 5 is an enlarged longitudinal sectional view of the kiln on line 5 5, Fig. 4. Fig. 6 is a diagrammatic view of the entire kiln.

This invention relates to a new and useful improvement in brick-kilns of that class wherein a tunnel is used, through which is formed a track or pathway for cars, said cars being adapted to travel through the tunnel to burn the brick carried by the cars. The temperature of the tunnel and the length of time required for the cars to travel therethrough is under the control of an operator, so that the bricks may be burned properly.

The invention consists in the construction, arrangement, and combination of the several parts, all as will hereinafter be described, and afterward pointed out in the claims.

In the drawings, 1 indicates a track upon which suitable cars, hereinafter to be described, are run. I will assume that these cars are loaded with the green brick from the press. From track 1 the cars are run onto a transfer car or table 2, preferably arranged beneath the surface of track 1 for obvious reasons. The transfer-car 2 carries the brick-laden car from track 1 to a track 3, running through the drying-tunnel 4. The end of this drying-tunnel, as shown in Figs. 1 and 3, is controlled by a gate or curtain 5 to prevent the escape of heat contained within the tunnel. When the transfer-car 2 is in position to deliver the brick-laden car on track 3, said brick-laden car is in line with a hydraulic cylinder 6, which is adapted to coöperate with the brick-laden car and force the same within the drying-tunnel beyond gate 5. I will assume that this operation of transferring the cars laden with green brick from track 1 to the drying-tunnel is repeated until the drying-tunnel is full of brick-laden cars, as shown by the dotted lines in Figs. 1, 1^a, and 1^b. It will be understood that as each car is forced into the front end of the drying-kiln it advances the train the distance of one car, the hydraulic cylinder 6 being preferably so controlled that its speed will not permit the cars to be carried beyond the desired point, as a space between the cars would cause them to jar one another when a new car is forced into the front end, which might disarrange some of the piled bricks carried by the cars.

When the cars reach the rear end of the drying-kiln, a gate 7, which closes said rear end, is raised to permit the cars to pass onto a transfer-car 9, preferably located in a pit similar to transfer-car 2. Transfer-car 9 is moved so as to deliver its brick-laden car onto a track 10, which is preferably arranged alongside of the drying-kiln and parallel therewith. From track 10 the cars are delivered onto the transfer-car 2, which carries them to a position in front of the burning-kiln 11, through which runs a track 12, onto which the cars are delivered from transfer-car 2. The brick-laden cars in passing through the drying-kiln enables the green brick to become thoroughly dry before being subjected to the intense heat of the burning-kiln. The length of time which a brick-laden car remains in this drying-kiln may be determined by the length of the intervals between the introduction of each green car. Of course the length of the tunnel also controls this, as does the temperature of the tunnel.

I will assume that the bricks on the cars have been dried and that the cars are in front of the burning-tunnel. A gate 13, which closes the end of the burning-tunnel, is raised, and a hydraulic cylinder 14 is operated to shove the cars through, said cylinder 14 operating similarly to cylinder 6. If desired, additional cylinders, as 15, may be employed midway the length of the tunnel for assisting

cylinder 14 in forcing the cars through the tunnel. These cylinders 15 are arranged outside of the tunnel and at an angle thereto, the plunger-rods operating on the cars through suitable openings in the sides of the tunnel 11. The rear end of this burning-tunnel is closed by a suitable gate 16, beyond which the cars are forced after the bricks are burned and cooled sufficiently to permit their exposure to the atmosphere. The track 12 extending through the burning-tunnel is continued beyond the same, said track leading to a point where it is desired to deposit or store the burned bricks.

17 indicates the furnaces whose construction is more clearly shown in Fig. 5. The products of combustion passing from these furnaces and the heat generated by the furnaces is conducted into the burning-tunnel through flues 18, which, as shown in Fig. 5, are arranged as a series of ports. A curtain-damper 19 is located in the burning-kiln between the furnaces and stack and is adapted to be raised or lowered to deflect the heat and prevent it pursuing a course entirely along the top of the kiln. A damper 20 controls an opening in the top of the tunnel 11, near its front end, which opening leads into a flue 21, connected to the stack 22. A curtain-damper 23 is arranged in the tunnel 11 behind the furnaces and is adapted to normally occupy a lowered position. This curtain-damper is raised to permit the passage of a single car, when a car is being introduced into the front end of the tunnel.

It will be noticed from the above that the products of combustion pass from the furnaces through the ports 18 into the tunnel, and, not being permitted to pass to the rear by reason of the presence of curtain-damper 23, which is normally lowered, said products of combustion will pass forwardly through the tunnel, through the opening controlled by damper 20 into flue 21, and out through the stack. If there is too much heat at the top of the kiln, the curtain-damper 19 may be lowered, as is obvious.

As the cars pass beyond curtain-damper 23 they enter a "cooling-chamber," as I shall term it, which forms the rear end of tunnel 11. The heat contained in the burned bricks will pass through a cross-flue 24 and into the drying-tunnel 4. If desired, the gate 16 at the end of tunnel 11 may be opened slightly in order to create a draft. The heat which passes through this cross-flue 24 is led to each side of the drying-tunnel 4 and introduced into said drying-tunnel through ports 25, which are arranged similarly to ports 18. From ports 25 the heat passes through the bricks on the car at that point, which point is the maximum drying-point in the tunnel, and thence passes forwardly through the tunnel 4 into a flue 27, controlled by a damper 26, and into the stack.

From the above it will be noticed that as the green bricks are introduced into the tunnel 4 they are gradually brought up to a drying heat whose highest temperature is at the point where the ports 25 lead into the tunnel. From that point on the bricks gradually cool, and when they reach the end of the drying-tunnel they can be safely exposed to the atmosphere. At no time during the passage of the bricks through the drying-tunnel are they too hot to handle. By utilizing the radiated heat from the burned bricks to dry the green bricks I am enabled to produce a brick of better quality, because the air which initially dries the bricks is free from carbon and other products of combustion which tend to discolor bricks in the kiln. So far as I am aware this feature of my invention is broadly new. After the bricks are dried they are carried back and introduced into the front end of the burning-kiln, where, it will be seen by reference to Fig. 1, they are not immediately placed in the draft of hot air, but are gradually heated by radiation until they pass behind the flue 21. The air and products of combustion at this point in the burning-tunnel are at a comparatively low temperature because the heat has been largely absorbed by the bricks on the cars in advance. As a car travels to the rear in the burning-tunnel bricks gradually get hotter until the car occupies a position between the two furnaces, when the bricks are subjected to the maximum heat. After the bricks leave this last position and before they pass beyond the curtain-damper 23 they are cooled slightly in the burning-tunnel, and when the bricks pass beyond curtain-damper 23 into the cooling-chamber they are then cooled by radiation, the radiated heat being utilized to dry the green bricks, as above described. By the time the bricks reach the rear end of tunnel 11 they are in condition to be exposed to the atmospherewith safety.

If at any time it is desired to decrease the heat of the furnaces without drawing the fires, ports 28, as shown in Fig. 4, may be opened. These ports may also be used as peep-holes and for the purpose of introducing a bar or other instrument to dislodge any bricks which might melt and adhere to the sides of the tunnel, which would prevent the train moving.

I prefer to provide flues 29, leading from the exterior and connecting with the ports 18, so that oxygen may be supplied to the products of combustion to reduce the free carbon as much as possible.

30 indicates the cars upon which the bricks to be dried and burned are piled. These cars are provided with suitable wheels, which are mounted on axles journaled in bearings secured to a frame composed of channel-beams. At the ends of this frame are dead-wood blocks 31, which are adapted to abut against each other when the train is being forced through the tunnel.

32 indicates suitable cross-beams secured to the channel-beams, upon which cross-beams and channel-beams are supported the

edges of tiling 33. The upper faces of these tiles are formed with ribs 34, upon which the pile of bricks to be dried and burned is supported. As shown in Fig. 5, these ribs 34 are adapted to register between the ports 18, so that the products of combustion from the furnaces have an unobstructed passage from said ports 18 under the bricks on the car, said ribs 34 and the bricks supported thereby forming practically flues which are continuations of the ports 18. The heat passing from the furnace through ports 18 enters the space between these ribs and is distributed through the pile of bricks on the car, whence it passes along the tunnel and through the piles of bricks on the adjacent cars.

Every car is alined with ports 18 in the manner shown in Fig. 5, and the bricks on said cars subjected to this intense heat for such period of time as is necessary to burn or vitrify the bricks.

In order to prevent the heated air from getting below the flooring of the cars, I preferably extend said flooring laterally under shoulders 4^a and 11^a in the tunnels, as shown in Fig. 4. Ports 18 are preferably located above these shoulders.

I desire to say that the cars are alined with the ports 25 in a manner similar to their alinement with ports 18 and that the cars are of such length and the cylinders 6 and 14 impart to their plunger-rods such a stroke as will cause the cars to occupy a proper position relative to these ports 18 and 25.

I am aware that many minor changes in the construction, arrangement, and combination of the several parts of the device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of the invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination with a drying-tunnel having a track extending therethrough, of an outside track extending from the rear end of the drying-tunnel to the front end of a burning-tunnel, a burning-tunnel, and transfer-cars coöperating with the ends of said outside track and the rear end of the drying-tunnel and the front end of the burning-tunnel; substantially as described.

2. The combination with drying and burning tunnels which are arranged parallel to each other, of furnaces on each side of the burning-tunnel, a flue connecting the rear ends of said two tunnels, a stack between the front ends of said tunnels, and flues leading from said tunnels to the stack; substantially as described.

3. The combination with drying and burning tunnels which are arranged parallel to each other, of furnaces on each side of the burning-tunnel, a flue connecting the rear ends of said two tunnels, a stack between the front ends of said tunnels, flues leading from said tunnels to the stack, and curtain dampers in the burning-tunnel between the furnaces, rear cross-flue, and stack-flue; substantially as described.

4. The combination with drying and burning tunnels which are arranged parallel to each other, of furnaces on each side of the burning-tunnel, a flue connecting the rear ends of said two tunnels, a stack between the front ends of said tunnels, flues leading from said tunnels to the stack, and dampers in said stack-flues between the tunnels and stack; substantially as described.

5. The combination with a drying-tunnel, of a track therethrough cars on said track, a transfer-car arranged at the rear end of the drying-tunnel, a track 10 for receiving cars from the transfer-car, a transfer-car located at the front end of the drying-tunnel for transferring the cars from track 10 to the burning-tunnel, and a burning-tunnel; substantially as described.

6. The combination with a drying-tunnel and a burning-tunnel arranged parallel to each other, tracks through said tunnels, a transfer-car coöperating with said tunnels, hydraulic cylinders for forcing brick-laden cars from the transfer-car into the tunnels, a transfer-car arranged at the rear end of the drying-tunnel, a track 10 for receiving cars from said last-named transfer-car, said track 10 also coöperating with the transfer-car at the front ends of the tunnels, and a track 1 coöperating with said last-named transfer-car; substantially as described.

In testimony whereof I hereunto affix my signature, in presence of two witnesses, this 1st day of July, 1896.

THOMAS L. MYERS.

Witnesses:
HUGH K. WAGNER,
F. R. CORNWALL.